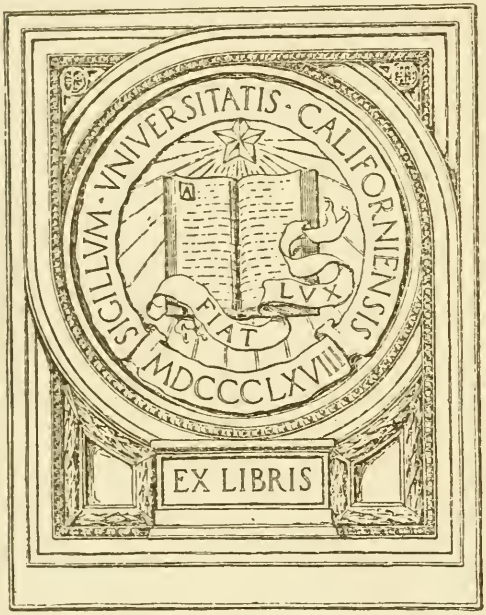
UNIVERSITY OF CALIFORNIA
AT LOS ANGELES



UNIVERSITY of CALIFORNIA
AT
LOS ANGELES

HEALTH AND THE STATE

HEALTH AND THE STATE

BY

WILLIAM A. BREND

M.A., CAMB. ; M.D. (STATE MEDICINE), B.SC., LOND.

OF THE INNER TEMPLE, BARRISTER-AT-LAW

LECTURER ON FORENSIC MEDICINE, CHARING CROSS HOSPITAL

SECOND IMPRESSION

LONDON

CONSTABLE AND COMPANY LTD.

1917

145574

RA
+55
B75h

PREFACE

A HEALTHY population is the finest form of national wealth, and in an industrialised country its possession depends to a large extent upon the completeness of the Public Health services and the success they achieve in securing a sound environment. In this country great efforts are made to promote healthy conditions of living: Government Offices administer Public Health measures, Local Authorities supervise sanitary conditions, and other organisations, public and private, spend vast sums in providing medical treatment for the sick. But the value of these efforts is seriously lessened by the division of administration among a number of uncoördinated authorities, which overlap in various directions, and yet leave large sections of the ground untouched. Social reformers, impressed with the confusion and delay resulting from this system—or want of system—have long urged the formation of a Ministry of Health in order to promote efficiency in administration, and it is not necessary at the present time to emphasise the importance of any steps likely to improve the health of the people. In this book I have outlined a scheme for complete reorganisation of the Public Health services, both central and local, the most important function assigned to a Ministry of Health being that of investigating the causes and distribution of disease, while actual administration of Public Health measures

is left to local authorities provided with increased powers. To demonstrate the reasons for this scheme it has been necessary to take a wide view of the scope of Public Health, and to illustrate the way in which efforts to attack disease have failed and erroneous views have been disseminated owing to insufficient investigation of the problems involved. For instance, in Chapter II. I have examined the question of infection in relation to the prevention of disease, with the object of showing that fear of infection is unwarrantably exaggerated in the public mind, and that segregation of infected persons in fever hospitals is useless as a means of preventing or eradicating many common infectious diseases. Again, in Chapter III. I have shown that there is little scientific foundation for the popular view that infant mortality is largely a result of adverse pre-natal conditions or maternal ignorance and neglect, and have given reasons for believing that it is mainly caused by post-natal factors over which the mother has little or no control. In succeeding chapters I have endeavoured to give a picture of the actual state of health among the people in England and Wales at the present time, and the extent and distribution of the principal diseases, for the purpose of showing the vast scope which still remains for the reduction of sickness and mortality. The main environmental causes of disease are then brought in review, and I have tried to enforce the lesson that curative measures yield far less return to the State than those which sweep away the conditions causing disease.

In the last chapter I have urged that the various local authorities at present engaged in Public Health administration, or in providing medical services, should be combined into a single Local Health Authority, responsible for protecting the health of the whole community in the locality, and providing such medical services as are neces-

sary. If this proposal were adopted, I would urge that care for the health of discharged disabled soldiers, many of whom will require medical treatment for prolonged periods, should form one of the functions of the authority. This suggestion is not considered in the book, because, at the time of writing, proposals were indefinite and constantly changing. I mention it here in order to deprecate the tendency already observable of setting up yet another series of institutions and organisations to provide for a special class of the community. This remark does not apply to the highly useful Committees which are training soldiers in handicrafts or assisting them to find work, but only to those movements which are concerned with the care of their health.

Throughout the book I have endeavoured to indicate the need for far closer investigation by the State of the problems presented by disease, and more thorough consideration of Public Health proposals before they become law—ends which can only be achieved by the establishment of a Ministry of Health.

Most of the chapter on the Insurance Act and parts of other chapters have appeared in *The Nineteenth Century and After*, and I am indebted to the Editor of that Review for kind permission to reproduce them. The chapter on Infant Mortality has been published by the Medical Research Committee, and my thanks are due to the Committee for permitting me to include it in the book. My best thanks are due to Mr. C. E. West, F.R.C.S., for reading the proofs and for many helpful suggestions.

W. A. B.

London, *February* 1917.

CONTENTS

CHAPTER I

PAGE

THE SANCTION OF THE STATE TO SAFEGUARD THE NATIONAL HEALTH . 1

The antiquity of State protection of Health—Public Health in the Middle Ages—The national 'survival value' of health—The influence of disease on the distribution of races—Responsibility for the health of native races—Health and social progress—The decline in the birth-rate—The demand for the reduction of disease—The great knowledge of the means of preventing and curing disease—The failure to apply that knowledge—The reasons for the failure: vested interests, complexity of administration, and want of knowledge in the legislature.

CHAPTER II

NATURE AND DISEASE 31

Evolution against disease: typhus; smallpox; enteric fever; scarlet fever; diphtheria; tuberculosis; syphilis—The problems of infection—The futility of disinfection—The assurance of the layman—The evils of exaggerated claims.

CHAPTER III

INFANT MORTALITY AND ITS PROBLEMS 62

The 'natural' rate of infant mortality—The avoidable loss of infant life in the United Kingdom—Infant mortality in town and country—The possible causes of infant mortality: poverty; defective sanitation; infectious diseases; artificial feeding; industrial employment of mothers; lack of attendance at birth—Maternal ignorance—Adverse pre-natal conditions—The effect of smoke and dust—The pathological causes of infant mortality—Deaths from 'developmental conditions' Still-births—The fall in infant mortality in recent years—Infant mortality in Bradford—The need for further research.

CHAPTER IV

PAGE

DISEASE AND DEFECTS IN CHILDREN AND ADULTS . . . 114

Children below the school age—Physical and mental defects in school children—Defectiveness in urban and rural children—Employment of children out of school hours—Children in special schools and institutions—The folly of palliative methods—Sickness in adults—Urban and rural sickness rates—Defects in army recruits—The principal causes of mortality: tuberculosis; pneumonia and other respiratory diseases; heart-disease; cancer; diarrhœa and enteritis; syphilis.

CHAPTER V

PUBLIC HEALTH, LAND, AND HOUSING 148

Man not biologically adapted to life in towns—Rural depopulation—The overcrowding of cities and the means of relief—Segregation of factories—Bad housing—The difficulties of clearing slum areas—The cost of building—'Summer camps'—Sleeping out.

CHAPTER VI

MEDICAL TREATMENT AMONG THE WORKING CLASSES . . . 168

The meaning of 'medical treatment'—The growth and importance of institutional treatment—The insufficiency of institutional treatment—Medical treatment by general practitioners—The size of working-class practices—'Lightning' diagnosis—The absence of expert assistance—Diagnosis in general practice—The lack of laboratories for expert diagnosis—The futility of treatment in a bad environment—The discontent with the panel system—Medical treatment of school children—Mortality in child-bed and its causes—Skilled attendance in child-bed—The pathological causes of deaths in child-bed: puerperal fever—General practitioner or midwife?—Attendance in confinement and infant mortality—Maternity benefit—The question of a public maternity service—Medical treatment and Public Health.

CHAPTER VII

PUBLIC HEALTH AND THE NATIONAL INSURANCE ACT . . . 210

The Insurance Act a Public Health measure—The German origin of the Insurance Act—The principles of administration of the Act—Local administration—Medical benefit—The supply of drugs—Sanatorium benefit—Sickness benefit—The Insurance Act and insanitary conditions—The Insurance Act and the advancement of Public Health knowledge.

CHAPTER VIII

PAGE

PUBLIC HEALTH AND FRAUD 265

Adulteration of food—Unsound food—Conditions under which food is prepared—Patent and proprietary foods—Patent and proprietary medicines—Unqualified practice.

CHAPTER IX

THE COMPLEXITY OF PUBLIC HEALTH ADMINISTRATION . . 288

Central administrative authorities—Local administrative authorities—The evolution of the Public Health services—Administration of sanatorium benefit—Administrative authorities and statistics—The discouragement of the present system.

CHAPTER X

THE NEED FOR A MINISTRY OF PUBLIC HEALTH . . . 311

The lack of scientific criticism of Public Health measures—The need for a Ministry of Public Health—Royal Commissions and Public Health research—Administrative Offices and Public Health research—The Office of the Registrar-General as the Ministry of Public Health—The proposal to form a Ministry by uniting the present administrative Departments—The personnel of a Ministry of Health.

CHAPTER XI

PUBLIC HEALTH AND LOCAL ADMINISTRATION 329

The responsibility of local authorities—The decline of democratic control in Public Health—Local needs and local control—Local administration and the cost of sickness—A single local health authority or 'Local Health Council'—Should the Health Council be the present Local Authority or a new body ?—Coördination of the Local Health Council and the Local Authority—A suggestion for financial arrangements—The question of a local medical service—The position of the voluntary hospitals—Conclusion.

INDEX 351

CHAPTER I

THE SANCTION OF THE STATE TO SAFEGUARD THE NATIONAL HEALTH

The antiquity of State protection of Health—Public Health in the Middle Ages—The national 'survival value' of health—The influence of disease on the distribution of races—Responsibility for the health of native races—Health and social progress—The decline in the birth-rate—The demand for the reduction of disease—The great knowledge of the means of preventing and curing disease—The failure to apply that knowledge—The reasons for the failure: vested interests, complexity of administration, and want of knowledge in the legislature.

The Antiquity of State Protection of Health

Sickness and disease are ancient foes of the human race, and men have always acted in concert against them. In early stages of society, communities groping in ignorance and bewildered by the dangers which surrounded them, turned to divine power for help. The gods of the ancient world, of Babylon, Egypt, Greece, and Rome, always included one whose special province was the curing of the sick; and at a later date the aspect of Christ as the Healer was prominent in early Christianity. Native races to-day entrust to the 'medicine-man,' the most potent influence at their command, the duty of warding off epidemics by incantations.

Belief in the influence of supernatural power, good or evil, upon disease, made the province of healing the sick far too important a duty to be left uncontrolled to the individual; and in early societies the function was always assumed by the State. In Egypt the practice of medicine was restricted to a special class of priests who had studied the Sacred Books of Hermes which dealt with the body

and its diseases.[1] These books were believed to have been inspired by Isis herself, and physicians who deviated from the laws they laid down did so at their peril. Diodorus says: "If, whilst following the rules laid down in the "Sacred Book, they do not succeed in saving their patients, "they are held free from all guilt; if, on the other hand, they "do anything contrary to those rules, they undergo capital "punishment."[2] In Babylon exorcism was practised by the priests; physicians formed an independent class, but their efforts were severely controlled by the State, as shown by the regulations in the celebrated code of Hammurabi, promulgated about 2280 B.C., which prescribes the fees patients are to pay, and ordains heavy punishments for negligent treatment.[3] In Greece medicine reached a high degree of development, and its practice was remarkably free from restraint, a condition which led Pliny to complain that there was no law to punish the ignorance of physicians, who were the only persons who might kill a man with impunity.[4] In ancient Rome, on the other hand, criminal practitioners might be executed, while negligent treatment rendered them liable to pay damages.

But it was not only in the practice of medicine that the State enforced control. Epidemics were believed to be due to mysterious agencies or the work of evil spirits, nevertheless it was rightly recognised that certain diseases are spread by transmission from man to man, and measures were taken by the community to prevent their progress, by isolating sufferers. Among the Israelites, the priests diagnosed leprosy, and for the leper it was laid down that "all the days wherein the plague shall be in him he shall be defiled; he is unclean: he shall dwell alone; without the camp shall his habitation be." Even conveyance of

[1] H. Oppenheimer, LL.D., "Liability for Malapraxis in Ancient Law," *Trans. Med. Leg. Society*, vol. vii.

[2] *Bibliotheca Historica*, i. 25, 3.

[3] The following examples of these provisions are quoted from *Babylonian and Assyrian Laws, Contracts and Letters*, by C. H. W. Johns:

"If a surgeon has operated with the bronze lancet on a patrician for a serious injury, and has caused his death, or has removed a cataract for a patrician and has made him lose his eye, his hand shall be cut off."

"If a surgeon has treated a serious injury of a plebian's slave with the bronze lancet and has caused his death, he shall render slave for slave."

[4] *Hist. Nat.* xxix. 8.

disease by clothing was recognised, for if the priest find that the garment of the leper is infected, " he shall therefore burn that garment, whether warp or woof, in woollen or in linen, or any thing of skin, wherein the plague is : for it is a fretting leprosy ; it shall be burnt in the fire." [1]

In the wonderful system of aqueducts and sewers in ancient Rome we may detect appreciation of the importance of water-supply and drainage in maintaining the health of the community. Public baths existed in Greece, and at a later date magnificent establishments, often with gymnasia attached, were built in Rome, the therapeutic value of which was well recognised, as shown by the following epigram quoted by Dr. J. D. Rolleston from the Greek Anthology : " The bath is the cause of many blessings. It removes the humours, dissolves the thickness of the phlegm, empties excess of bile from the bowels, eases painful itching, sharpens the eyesight, cleanses the ear-passages of the deaf, strengthens the memory, removes forgetfulness, clears the mind, makes the tongue more active and purifies and lightens the whole body." [2]

Public Health in Later Times

In mediæval Europe, the State was continually taking measures, superstitious and futile though they were, to protect the people from disease. Mainly these were directed against the devastating epidemics which swept over countries from time to time, divine help being sought by prayers, processions, and exhibition of holy relics. Jacobus de Voragine, Archbishop of Genoa, writing in the thirteenth century, describes the efforts made by Gregory the Great as early as A.D. 590 to stay the ravages of a fierce outbreak of plague in Rome. He says : " And " because the mortality ceased not, he ordained a procession " in which he did bear an image of Our Lady, which as is " said S. Luke the Evangelist made, which was a good " painter, he had carved and painted it after the likeness " of the glorious Virgin Mary. And anon the mortality " ceased and the air became pure and clear, and about the

[1] Lev. xiii.

[2] *Trans. Roy. Soc. of Med.*, 1913.

"image was heard a voice of angels." [1] For hundreds of years these processions bearing pictures of the Madonna and effigies of saints were ordered by the ecclesiastical authorities to traverse the streets in order to stay the ravages of plague. In the Litany we still pray to be delivered from plague, pestilence, and sudden death. In later years, more scientific efforts were made, but it was still the State which assumed responsibility. In the plague of London the Lord Mayor issued orders for the cleaning of the streets, the marking of houses, and the prompt burial of the dead, and the King commanded the College of Physicians to give advice and prescriptions for treatment.

The practice of separating lepers from their fellow-men was continued during the Middle Ages, sufferers from the disease being compelled to live in special houses away from the vicinity of towns, and being prohibited from entering churches or inns. They were required to wear a long grey gown with hood drawn over the face, and carry a clapper or bell in order that healthy people might know of their approach and shun them.

The protection of the community against dangerous lunatics was another function which was early undertaken by the State. At first these unfortunate people were treated with great cruelty, confined in gaols, and even executed, and it was not until 1547 that the first Bethlehem hospital was established for their detention in Bishopsgate.

Compulsory segregation of the sick was not, however, the only means by which the State sought to protect Public Health. Although hygiene has only been placed on a scientific basis in quite modern times, many of the essential causes of ill-health were recognised centuries ago, and measures were taken to suppress them. It is no new discovery that accumulations of filth, pollution of the air, and fouling of water-courses are injurious to health, and the archives of the city of London contain records of many administrative measures directed against these evils.[2]

[1] Quoted by Raymond Crawfurd, M.D., in "Plague Banners," *Trans. Roy. Soc. of Med.*, 1913.

[2] A valuable collection of extracts from these archives is contained in *Memorials of London and London Life in the 13th, 14th, and 15th Centuries*, by H. T. Riley. These are extensively quoted by Sir John Simon in his *English Sanitary Institutions*.

During the thirteenth and fourteenth centuries laws were made against permitting pigs to wander in the streets, melting tallow in Chepe, flaying horses or slaughtering oxen, sheep, or swine in the city, and melting solder in Eastchepe "unless the shaft of the furnace was raised." Every man was obliged to keep clean the part of the street in front of his own house, and the throwing of filth from houses into the streets and lanes of the city was forbidden under severe penalties. In 1357, Edward III. issued an order to the Mayor and Sheriffs prohibiting the throwing of filth into the rivers of Thames and Flete, for he "had "beheld dung and laystalls and other filth accumulated "in divers places in the said city upon the bank of the said "river," and had "also perceived the fumes and abominable "stenches arising therefrom: from the corruption of which, "if tolerated, great peril, as well to the persons dwelling "within the said city as to nobles and others passing along "the river, will, it is feared, arise unless indeed some fitting "remedy be speedily provided for the same." Under Henry VIII., Commissioners of Sewers were appointed to keep the water-courses in order and prevent them from being polluted by refuse. Since these beginnings the State has continually increased its control over the water-supply in the interests of Public Health, either by itself undertaking the service through municipalities, or by enforcing laws and regulations when the supply is in the hands of private companies.

Efforts to prevent overcrowding and disease resulting therefrom are also of long standing. In 1580, Elizabeth issued a proclamation forbidding the erection of new buildings in the city or within three miles of its gates, but in 1583 the Lords of the Council report that in spite of this proclamation buildings had greatly increased, "to the danger of pestilence and riot."[1] An Act of 1593 recites that "great mischiefs daily grow and increase by reason of pestering the houses with divers families harbouring of inmates, and converting great houses into several tenements, and the erecting of new buildings in London and Westminster. Under Charles I., the Commissioners

[1] Simon, *op. cit.*

of Buildings complain that, "the multitude of newly erected tenements in Westminster, the Strand, Covent Garden, Holborn, St. Giles, Wapping, Ratcliff, Limehouse, Southwark, and other parts . . . was a great cause of beggars and other loose persons swarming about the city, that the greater part of their soil was conveyed with the sewers in and about the city, and so fell into the Thames to the great annoyance of the inhabitants and of the river; that if any pestilence or mortality should happen, the city was so compassed in and straightened with these new buildings that it might prove very dangerous to the inhabitants."

The jerry-builder and slum landlord were early in existence, as may be gathered from the following extract from a tract of the time of James I.: [1]

The desire of Profitte greatly increaseth Buyldinges, and so muche the more, for that this greate Concurse of all sortes of people draweinge nere unto the Cittie, everie man seeketh out places, highe-wayes, lanes, and coverte corners to buylde upon, yf it be but Sheddes, Cottages, and small Tenementes for people to lodge inn. . . . Thes sorte of coveteous Buylders exacte great renttes, and daiely doe increase them, in so muche that a poore handie craftesman is not able by his paynefull laboure to paye the rentte of a smale Tenement and feede his ffamilie. Thes Buylders neither regarde the good of the Coñon-wealthe, the preservac̃on of the health of the Cittie, the maynetenance of honeste Tradesmen, neither doe they regarde of what base condicion soever their Tenantes are, or what lewde and wycked practizes soever they vse so as their exacted renttes be duely payed, the w^{ch} for the moste parte they doe receave either weekely or moontheley.

It is curious to note these efforts made by the State hundreds of years ago to prevent overcrowding; to recall that they have been followed by a long succession of Housing Acts, Building Acts, and Labourers' Dwellings Acts right up to the Town Planning Acts of recent years; and then to reflect upon the deplorable housing and overcrowding of large masses of the poorer population to-day. Housing is the direction in which Public Health has made least progress in spite of much legislation, and this has been due partly to the opportunities which the building of

[1] Quoted by Sir Laurence Gomme in *The Making of London*, 1913.

houses affords for the creation of vested interests, and partly to short-sighted legislation, which, while removing evils in one area, has permitted their re-establishment in another.

The prevention of adulteration of food and the selling of bad food are other directions in which the State early concerned itself for the benefit of the community. Dr. Wynter Blyth has given an account of these practices and the punishment of dishonest vendors in his well-known book.[1] Adulteration of wine and bread appears to have begun very early. Pliny alludes to frauds practised by bakers by adding a soft white earth to bread, and in Athens the adulteration of wine led to the appointment of a special inspector whose duty it was to detect and stop these practices. In Europe, from the eleventh century onwards, bakers, brewers, ' pepperers,' and vintners were frequently punished for corrupt practices. The sale of bread was regulated by Assize as early as 1203. The Assize of 1582 contains the following :

> If there be any that by false meanes useth to sell meale, for the first tyme he shall be grievously punished, the second tyme he shall lose his meale, the III tyme he shall foreswere the towne and so likewyse the bakers that offende. Also bouchers that sell mesell porke or mozen flesche : for the first tyme they shall be grievously amerced, for the second tyme so offendinge they shall have the judgement of the pillory, for the third tyme they shall be comytted to pryson until ransomed, and the fourth tyme they shall foreswere the towne ; and thus ought other transgressors to be punished, as cooks forestallers, regrators of the markets when the cookes serve, roste, bake, or any otherwyse dresse, fysche or flesche unwholesome for man's body.

Many other instances are given by Dr. Blyth of severe punishments for adulteration of food. An *Ordonnance* of Paris of 1396 forbade the colouring of butter with ' saucy flowers,' other flowers, herbs, or drugs. In 1491 three bakers convicted of selling bread ' too small ' were stripped and beaten with rods through the streets of Paris. At Biebrich in Germany, in 1482, a falsifier of wines was condemned to drink six quarts of his own wine. He died from the effects.

[1] *Foods : their Composition and Analysis.*

The nineteenth century witnessed a great development of State activity on behalf of Public Health in all civilised countries. In the British Isles, general sanitation, housing, water-supply, food, milk, infectious diseases, insanity, training of midwives, medical qualifications, Poor Law infirmaries, protection of infant life and maternity, and provision of medical treatment have all been the subject of Acts of Parliament, many of which have been amended and enlarged time after time. Principles of hygiene are enforced in the home, the school, the mine, and the factory. The early and inhuman methods of segregating infected persons have long disappeared, and have been succeeded by a system of compulsory notification of disease, combined with provision for treatment in fever hospitals, which is accepted voluntarily in the vast majority of instances.

If we look at the legislation of the last half-century, it is safe to say that Public Health measures in one form or another have occupied a larger share of Parliamentary time than either trade, finance, education, or even national defence, yet alone of these activities does it not possess a special Government Department. In the Middle Ages, under the influence of monasticism, the body was regarded as the enemy of the soul, and the efforts of States under the guidance of an all-powerful Church were directed towards securing salvation in an after-life. No punishments were too great for infringement of ordinances which might imperil that salvation, and men have been hanged for eating meat on a Friday and for blasphemy. So late as 1754 the proposal to register all births and deaths in this country was defeated in Parliament, owing to popular opposition on the ground that it would involve committing the sin of David.[1] In a more enlightened age, care for the bodily health, as far as the State is concerned, has replaced the mediæval care for the soul, and the Churches also have extended their mission to the alleviation of disease in this world. In the words of Bishop Ryle, Dean of Westminster: "It is no longer sin which seems to be regarded as the foe, but physical disease, suffering, and death. The war-

[1] *Gentleman's Magazine*, 1754.

fare which excites public sympathy is the warfare against 'bacterial rulers of darkness,' against epidemics, against fevers, against cancer." [1]

The Prominence of Preventive Measures

Before examining the profound meaning of the concern which States have always displayed for the health of their members, we may note one feature which has been prominent throughout, and that is the large share in the national efforts occupied by preventive measures. The importance early attached to water-supply, removal of refuse, and overcrowding illustrate this point. The ruthless sacrifice of the individual for the protection of the community is exemplified by the laws made against the leper. The measures taken against epidemics, such as the carrying of holy relics or the lighting of fires in the streets, had for their object the averting of the terror from those who were untouched, for the sick were often allowed to die in solitude and neglect. Compulsory vaccination, notification of disease, and all our recent sanitary efforts are directed towards the prevention of sickness.

Curative measures, on the other hand, such as provision of refuges for the sick and of medical treatment, have not formed a conspicuous feature of State activity until quite recent years. Everywhere the earliest institutions for the sick were the outcome of individual benevolence or were established by religious orders ; and the great hospital system in this country, which had its origin in the monastic institutions, has been developed almost entirely by private energy and munificence. Some provision was made for the care of the sick poor in the sixteenth century, but except for an extended use of the fever hospitals, it was not until the passing of the Insurance Act that any attempt was made on a large scale to provide medical treatment through the State for persons not belonging to the indigent class. The State in the past has indeed been little moved by motives of sympathy ; its ordinances have been framed by the sound for the protection of the sound, and the

[1] Sermon preached at Westminster Abbey before the members of the Seventeenth International Congress of Medicine, London, 1913.

sick have been left to fend for themselves, or seek help from the more kindly of their fellow-creatures. Even when provision has been made by the State, it was quite clearly the outcome of desire to protect others rather than of solicitude for the sick. The cruelties which were inflicted on lunatics show that they were not confined for their own benefit, but mainly for the protection of the public; and the earlier Poor Laws were directed quite as much towards the repression of mendicity and petty crime as towards providing for the infirm poor. Harsh though this attitude may appear, it has probably been based upon a sound national instinct, for the sick person was often of no further use to the community, and the State was concerned only in protecting the community with little reck for the sufferings of the individual who fell by the wayside.

The National 'Survival Value' of Health

National concern for the communal health was probably, in the first instance, a development of the 'herd-instinct' which leads gregarious organisms to unite for their common protection. The survival value of this instinct is seen in its simplest form in savage tribes, among whom it is obvious that that tribe which can place the largest number of able-bodied warriors in the field has the greatest chance of overcoming its enemies in a conflict where defeat may mean annihilation. The principle equally applies, though on a much larger scale, to European warfare to-day, when belligerent nations strive to arm as large a proportion as possible of their adult male populations. The number of men available bears a very direct relation to the average state of health of the nation, and we know that in this country it has been found necessary to exempt a substantial proportion of men from military service either by reason of their defects and ailments, or from their failure to attain a standard of growth which, measured by well-developed individuals, must be looked upon as lamentably low.

In the industrial competition between peoples, national

health also plays an important though perhaps less conspicuous part. We have an example in the Insurance Act of the way in which the State looks upon health from the utilitarian standpoint. That Act does not purport to cure or prevent disease in the community, but only in the working part from whom some return can be expected; furthermore, it definitely lays down that 'incapacity for work,' and not ill-health is the criterion for receiving benefit, and that assistance ceases when capacity for work is regained, though this by no means necessarily connotes return to full health.

With the growth of knowledge and civilisation, the primitive instinct of the savage to protect the national health is reinforced by recognition of the influence disease has in bringing about poverty, crime, inebriety, and other evils. It is seen that when the bread-winner is laid low by sickness, not only he but his entire family may become a burden on the State; the pathological element in much crime is recognised; and inebriety is more and more traced to the degeneracy which results from a combination of vicious influences. The Poor Laws contain an effort to meet the destitution caused by disease, and the establishment of criminal lunatic asylums is a recognition of the fact that disease may be responsible for crime. Still later in social progress it is recognised that in providing for the health of the nation the State must look beyond the existing generation. It is learnt that steps taken now will act and react upon posterity for long periods, and that the best way to provide sound health in the future is to secure it in the infants and children of to-day. Though long appreciated by students, the lateness of the State to receive and act upon this conception is illustrated by the fact that, in the history of Public Health efforts, measures to protect the lives and welfare of infants were the last to find a place.

Thus in numerous directions sound health is of the greatest importance to a people, and may even determine its very existence. And since the number of those who cannot contribute to the general advancement of the community, who, whether from disease or stunted growth,

are unfit for military service or drop out of the industrial army, or become a burden on the healthy, depends more upon the environment than upon any other factor, the responsibility for maintaining a healthy environment and thereby reducing national waste to a minimum is one which must be accepted by the whole community.

Health and Empire

So far we have been considering the survival value of health in a people limited to one country, but the question has aspects of still greater importance to a nation with colonies and dependencies all over the world. The influence of disease in fixing or modifying geographical boundaries has been considerable; and the present distribution of peoples on the globe has been largely determined by the prevalence of different diseases in different areas. The white man has failed to colonise many of the fairest and most fertile regions of the earth owing to the deadly effect upon him of malaria, yellow fever, and other tropical diseases; and the negro when associated with white communities suffers severely from tuberculosis. But modern science has discovered the causes of many of the diseases which have hitherto stood in the white man's path, and has shown that they can be successfully attacked, thus foreshadowing an entirely new era in colonisation. Countries hitherto almost uninhabitable by Europeans are now being rendered healthy and fit for occupation. Already one striking result of the new knowledge has been seen. De Lesseps and his successors failed to construct the Panama Canal mainly because of the frightful mortality from malaria and yellow fever among the labourers. But the researches of Laveran, Koch, Manson, Ross, and others on malaria, and of Reed, Carroll, Lazear, and Agramonte on yellow fever, have shown that the parasites of these diseases are conveyed by mosquitoes, and that by taking precautions against the bites of these insects, draining the pools and marshes which are their breeding places, and preventing the development of the larvæ by covering the surface of stagnant water with petroleum,

both diseases can be practically eliminated. By adopting such measures Colonel Gorgas, acting under the American Government, was able to bring to a successful conclusion one of the greatest engineering works of modern times. Similar efforts in other countries have been equally successful in reducing the incidence of these diseases, and there is good reason to believe that science has now provided a weapon which will enable mankind eventually to rid itself of one of its most deadly scourges.

It is obvious that work of this sort not only ought, but can only efficiently be carried out by the State. It is true that the foundation work, the patient scientific research, can be and usually has been conducted by individual effort and initiative; but without State assistance these efforts are necessarily limited, and until quite recent years this country has not been conspicuous for the help it has rendered to scientific research, or for the rewards it has bestowed upon those from whose labours it has derived so great benefit. But the application of this knowledge to a community demands funds, organisation, and control which can only be provided by the State, whether it be to reduce malaria or plague in India, blackwater fever in West Africa, beri-beri in the Malay Archipelago, sleeping sickness in Uganda, or yellow fever in South America. To a very considerable extent indeed this has been realised and acted upon, and colonising Powers are now setting up laboratories at home for the study of tropical diseases, and in their colonies are opening hospitals, establishing State medical services, promoting sanitation, and spreading knowledge of hygiene by means of leaflets, lectures, and teaching in schools. Study of reports such as those issued by the Advisory Committee for the Tropical Diseases Research Fund reveals a most gratifying picture of the energy which is being displayed in combating disease in the remoter parts of the world. It is a remarkable fact that it has been found possible in many colonies and dependencies to take steps, such as the establishment of State medical services, which vested interests have rendered impracticable in mother-countries.

Still, there is another side to this picture. Our achieve-

ments should be measured not by what we are doing, but by what we might do having regard to our knowledge, and we learn from the words of Sir Ronald Ross in the Huxley Lecture for 1914, that we have still far from made full use of that knowledge.[1] After describing the extent to which diseases are carried by insects and other organisms, he said: "We now have a great sanitary ideal put before us—so to manage our habitations, villages, towns, and cities that the vermin in them shall be reduced to the lowest possible figure. . . . It demands only intelligence, energy, and organisation on the part of administrators. Unfortunately these qualities are not always forthcoming, and administration often lags years behind the dictates of science. Although fifteen years have elapsed since many of the facts which I have described were discovered, I think that I may say, after constant study of the subject and with all due consideration, that mankind has hitherto not effected more than about one-tenth of the improvement of health which it might have effected already if it had put its heart into the business. When I had completed my work in 1899, I had fondly dreamed that a few years would see the almost complete banishment of malaria from the principal towns and cities in the tropics —that those benign climates and those beautiful scenes would be almost rid at once of a scourge which had blighted them from time immemorial. In this I have been disappointed. True, much has been done in certain places, as in Panama, Ismailia, Italy, West Africa, and parts of India and the Malay States, and in some other spots; but much more might have been done had we remained fully alive to our opportunities—and our duties. It is not the fault of science that we do not fully utilise the gifts which she gives to us."

Responsibility for the Health of Native Races

Apart altogether from colonial expansion or commercial development, a great colonising Power like Britain is under a strong moral obligation to protect the health of subject races over which she rules, races of different colour,

[1] *Recent Advances in Science and their bearing on Medicine and Surgery.*

diverse religions, and varied social customs. In regard to India the obligation is all the greater since her native troops have been called upon to fight in European warfare. In the main this obligation has been recognised and much has been done to discharge it, but the terrible ravages of disease in India and the Dependencies shows that there is still vast scope for action. In India, during the last eighteen years, more than eight and a quarter millions of persons have died from plague, and seven millions from cholera.[1] Deaths from malaria have been officially estimated at 1,200,000 a year in ordinary years,[2] and since the case mortality is small the total number of persons infected must be enormous. Tuberculosis is considered by Dr. C. Muthu to cause an annual mortality of over a million, and the rate has been steadily rising since 1901.[3] In Uganda, sleeping sickness is estimated to have caused 200,000 deaths between 1897 and 1906. This country also provides an illustration of the tragic consequences which may follow the abandonment of native customs under the influence of European civilisation. Before the British occupation of Uganda polygamy was practised by the natives, and in consequence few women were unprovided for, and there was little or no prostitution. The introduction of Christianity led to the abandonment of polygamy, removal of restrictions on the liberty of women, and abolition of punishments for immoral offences, with the result that a prostitute class came into existence, and a devastating outbreak of syphilis occurred.[4] Colonel

[1] Report by Dr. R. W. Johnstone to the Local Government Board on the *Progress and Diffusion of Plague, Cholera, and Yellow Fever throughout the World*, 1913.

[2] Ross, *op. cit.*

[3] "Tuberculosis in India," *Practitioner*, June 1915.

[4] The Rev. J. Roscoe, C.M.S., Chief of the Theological College at Kampala, who has spent twenty-five years in Uganda, says: "Among the Baganda up to about twelve years ago a custom prevailed of keeping the women belonging to the tribe under strict confinement and surveillance . . . hence immorality and promiscuous intercourse did not exist. At approximately the time of the outbreak of syphilis the chiefs of the Baganda tribe, the majority of whom had become Christians, decided to remove these restrictions as being contrary to Christian teaching and set the women free. This was done, and from that time the women were released, henceforth to roam where and whither they willed, and do as they liked. The result of the removal of these restrictions was exactly what one would have expected, *i.e.* promiscuous sexual intercourse and immorality. I consider the above to have been the main cause of the outbreak of syphilis among the tribes of the Protectorate."—Quoted by Col. Lambkin in *A System of Syphilis*, edited by D'Arcy Power, F.R.C.S., and J. Keogh Murphy, F.R.C.S., vol. ii., 1908.

Lambkin, who was appointed by the Government to investigate the conditions, estimated that more than half the population of the Protectorate was infected, and that in some parts of the country the incidence of the disease was as high as 90 per cent, and was responsible for more than half the total infant deaths. He concludes by saying that: "In fact, as things stand at present owing to the presence of syphilis, the entire population stands a good chance of being exterminated in a very few years or left a degenerate race fit for nothing."[1]

Sir Harry Johnstone has said of the Baganda tribe: "In my opinion there is no race like them among the negro "tribes of Africa. They are the Japanese of the Dark "Continent, the most naturally civilised, charming, kindly, "tactful, and courteous of the black people." Acting under the best of motives, we have forced alien ideas upon these people, and have interfered with their social customs without taking due precautions for their safety; and the result has been that we have unwittingly caused a hideous tragedy in the native villages of a country we have rechristened a "Protectorate."

Health and Social Progress

We have considered the part which is played by health in determining the military strength of a people, its relation to other countries, and its colonising power, and we must now note the not less important value of health in internal affairs. The immense effect of sickness in producing poverty is so well known, and has been so ably investigated by many writers, that there is no need to dwell further upon it here. On the other hand, the influence of poverty in producing sickness has perhaps been exaggerated. We shall see that it is quite possible to be extremely poor and extremely healthy, and that some of the healthiest classes in these Islands are among the most poverty-stricken. The human species needs but little to keep it in health—simple food, homely clothing, and the rudest of shelters will suffice—though this is not

[1] *Op. cit.*

to say comfort and happiness; yet even these, health alone will go a long way towards providing. Poverty acts as a cause of disease mainly by compelling people to live in an unnatural and unhealthy environment, and so long as they remain in that environment neither Poor Law doles nor sickness benefit will appreciably improve their health.

Much crime and vice has now also been shown to be due to a state of degeneracy, one of the main factors in the production of which is sickness. Dr. Goring [1] has shown that there is no such thing as a criminal type, and we have almost got rid of the notion that a tendency to commit crime is inherited, save in a small proportion of persons born with a definite pathological disorder such as feeble-mindedness or epilepsy, a belief which was largely the result of flagrant misunderstanding of various social investigations, as, for example, that made by R. L. Dugdale into the history of the so-called 'Jukes' family.[2] A widespread improvement in health would lessen crime, inebriety, and other vices, and relieve the State of part of its burden in maintaining prisons, police forces, and homes for inebriates.

In other directions sickness leads to loss of labour and wages, added expense in production, diminished efficiency, and waste of educational opportunity, for there are always a considerable proportion of children away from school by reason of ill-health.

We shall see in succeeding chapters that the largest factor in the causation of disease and mortality is a defective environment, particularly that of an overcrowded town, and that a high proportion of sickness—not exactly measurable, but probably not less than a third of the

[1] *The English Convict: a Statistical Study.*

[2] Professor Giddings, in his introduction to the fourth edition of *The Jukes, a Study in Crime, Pauperism, Disease and Heredity*, says: "An impression quite generally prevails that 'the Jukes' is a thorough-going demonstration of 'hereditary criminality,' 'hereditary pauperism,' 'hereditary degeneracy' and so on. It is nothing of the kind, and its author never made such claim for it. Far from believing that heredity is fatal, Mr. Dugdale was profoundly convinced that environment can be relied on to modify and ultimately to eradicate even such deep-rooted and widespread growths of vice and crime as the 'Jukes' group exemplified." The book shows quite clearly that those members of the family who lived under vicious influences became criminals, paupers, and prostitutes, while those who had opportunities of getting into a better environment became steady and industrious members of the community, yet curiously enough it has been the illustration most quoted by those who believe in the all-powerful influence of heredity.

total—could be avoided by securing a healthy environment. The economy to the State which would result from appreciably lessening sickness and disease would be very large. At present we spend immense sums on sanatoria, Poor Law infirmaries, public hospitals, medical services, and sickness benefit, and to these must be added the great volume of charitable donations which maintain the voluntary hospitals, and private expenditure on medical treatment; yet all this outlay, amounting to many millions, does nothing to alter the environmental conditions which are mainly responsible for disease, and very little to prevent the spread of disease. A keener sense of sympathy with suffering is probably the reason why so much greater attention is now given to curative measures, but the earlier policy of directing efforts mainly towards the prevention of disease was the sounder, and in the long run is of the greater benefit to the community.

The Decline in the Birth-Rate

There is yet another reason for urging national care for national health, and that is the heavy and continuous fall which has occurred in the birth-rate during the last thirty or forty years. The effects which this fall will ultimately have on the population are far from being generally appreciated. Simultaneously with the decline in the birth-rate there has been a fall in the death-rate, though not to so great an extent; and it has been generally assumed that the low death-rate would continue and that, provided the birth-rate did not fall below a certain point, there would always be a comfortable margin between the two rates, which would secure a reasonable annual increase of population. But the question is not merely a simple one of subtraction of death-rate from birth-rate. The ultimate effect of a long-continued fall in the birth-rate is to raise the average age of the population; and as this rises, the death-rate increases altogether apart from any environmental conditions influencing disease. We see the effects of this process in the relatively high death-rates in France and Ireland, in the one case due to restriction of births,

and in the other to long-continued emigration of the younger people. Yet both these countries offer healthier conditions of life than England, and their death-rates when made truly comparable by standardisation are lower than that of England. Thus sooner or later it seems inevitable that we shall have a rise in the crude death-rate in this country, and it is probable that the turning-point has already been reached and passed, for the death-rate after falling steadily for many years has been rising since 1912.

The increase in the average age is not limited to the death-rate in its effect. Eventually it begins to reduce the proportion of women of reproductive age in the population, which combines with deliberate restriction in still further lowering the birth-rate. Hence with a death-rate rising, a birth-rate tending to fall at an accelerated rate, and the probability of extensive emigration after the War, we are within measurable distance of a stationary if not a declining population in this country.

The effect of the fall in the birth-rate is equivalent to a loss of life immensely greater than has ever been produced by the most devastating epidemic, but since it is not accompanied by the open horrors of an epidemic, the matter is one which excites very little concern. The causes of the decline in the birth-rate are well known, but it is not easy to see what steps could be taken by the State to arrest the process, and indeed it is very doubtful whether any action by the State would be effective. There is one school of opinion which considers that the fall in the birth-rate has been highly beneficial to the nation, and actively encourages its furtherance; but whatever views may be held on this point, there can be no two opinions but that, in view of the fall, the State should strive to make the very best of the population which does come into existence. No Government is in a strong position to go to mothers and urge them to have more children so long as the infant mortality rate remains at least twice as high as it need be, and many thousands of young lives are sacrificed annually to preventable causes.

The Demand for Reduction of Disease

No big step in social progress is possible without the active sympathy of large masses of the community, and in this respect the movement for improving the national health has the greatest support. Probably at no time have men had so strong a sense of responsibility for others as at present; and the keen desire to relieve human misery resulting from disease shows itself in the large army of social workers who as members of Care Committees, Boards of Guardians, Social Service Leagues, Societies for the abolition of tuberculosis, syphilis, and other diseases, hospital committees, infant clinics, medical aid institutions, and other organisations, are devoting themselves to helping their less fortunate fellow-creatures. Much of this work is wasted owing to lack of coordination between the different bodies, and sometimes to excess of zeal without corresponding knowledge; but the motive for these efforts indicates an appreciation of national needs which is the best augury for progress. It is certain that the vast bulk of the people in this country do not want the state of wretchedness at present existing among large sections of the poor in big cities to continue. Demand increases for vigorous attack on the evils which destroy health; and discontent is widely expressed with the half-hearted measures adopted by Parliament, the unrealised promises of Ministers, and the incompetence of official administrators. Mr. Galsworthy has given voice to this widely-felt sentiment in the following words: "I am moved to speak out what I and, I am sure, many others are feeling. We are a so-called civilised country; we have a so-called Christian religion; we profess humanity. . . . And yet we sit and suffer such barbarities and mean cruelties to go on amongst us as must dry the heart of God. I cite a few only of the abhorrent things done daily, daily left undone; done and left undone without shadow of doubt against the conscience and general will of the community—sweating of women workers; insufficient feeding of children; employment of boys on work that to all intents ruins their chances in after life, as mean a

thing as can well be done ; foul housing of those who have as much right as you and I to the first decencies of life. . . . And I say it is rotten that for mere want of Parliamentary interest and time we cannot have manifest and stinking sores such as these treated and banished once for all from the nation's body. . . . Parliament is an august assembly of which I wish to speak with all respect. But it works without sense of proportion or sense of humour. Over and over again it turns things already talked into their graves ; over and over again listens to the same partisan bickerings, to arguments which everybody knows by heart, to rolling periods which advance nothing but those who utter them. And all the time the fires of live misery that could, most of them so easily, be put out, are raging, and the reek thereof is going up." [1]

Sympathy for manifest evils, and self-sacrifice for others have no limit when the emotions are directly stimulated. In a mining disaster, volunteers are always ready to face almost certain death in order to rescue their comrades. A few years ago a man was overcome by deadly gases in a sewer. A fellow-labourer fully cognizant of the danger at once descended to help him, but fell from the ladder when halfway down ; another descended and yet another. When eventually brought up, three of the four were dead. Such acts of heroism, unexcelled by anything done on the battlefield, serve to show the strength of the social spirit among us. The difficulty is to arouse this spirit against evils of which the knowledge must be conveyed through the intellect and not by the immediate stimulus of the emotions. Many who would spare no effort to help a person injured in the streets before their eyes, will read quite unmoved a statement that, " the hospital provision in England is seriously inadequate." Only those who know by experience what these words mean—the sickening delays, the anxiety of those waiting for surgical treatment, the needless suffering, and even loss of life—appreciate their tragic significance. The daily record of horrors from the battlefield leads all classes to contribute from their wealth or services to the assistance

[1] *Times*, February 28, 1914.

of wounded soldiers, but we do not hear of great houses being placed at the disposal of men injured in a colliery disaster, or of aristocratic ladies ministering to sick cotton spinners of Lancashire, yet both these classes risk life and health in doing work which is essential for national welfare. The sympathy for them certainly exists, but the stimulus needed to evoke it is lacking. This aspect of the human mind has been finely expressed by Mrs. E. B. Browning in *Aurora Leigh* :

> A red-haired child
> Sick in a fever, if you touch him once,
> Though but so little as with a finger-tip,
> Will set you weeping ; but a million sick . . .
> You could as soon weep for the rule of three,
> Or compound fractions.

Knowledge of the Means of preventing and curing Disease

Desire to prevent or cure disease would be of little effect without knowledge of the means by which these ends can be achieved, and of this knowledge we now possess a large store. Medicine has still much to learn ; the problem of cancer remains unsolved, and the cure for many diseases has yet to be discovered, nevertheless the advances made during the last thirty or forty years have been unprecedented. Surgery, in particular, has saved many thousands of lives and done much to repair the crippling effects of disease ; serum therapy and kindred methods have proved their curative value in diphtheria and their preventive effects against tetanus and typhoid under the severe test of war ; bacteriology has furnished new means of determining the presence of grave diseases ; and X-rays, light rays, and radium have provided potent aids to diagnosis and treatment. Not less great, too, have been advances in knowledge of preventive medicine. We are still uncertain of the ways in which many diseases are transmitted, and the whole subject of infection demands further study, but statistics now enable us accurately to recognise unhealthy occupations and locate disease-propagating areas. The refinements of chemistry and physics

have provided new methods of examining water, analysing foods, testing the condition of the air, and disposing of refuse and sewage.

The Failure to apply Knowledge

For securing sound Public Health, then, two important conditions are fulfilled : there is first the widespread desire among all classes to reduce sickness and disease, and there is the knowledge furnished by science, which should enable that end largely to be attained ; but when, bearing in mind these facts, we survey the actual condition of large masses of the English people to-day, the relatively small extent to which that knowledge is utilised for the public welfare is little short of amazing. We know that bad housing and, particularly, overcrowding are fruitful causes of disease, but all our large cities exhibit huge slum areas, dirty, dismal, and unhealthy, where the infant mortality rate reaches a height which would disgrace a savage people, and where the efforts of local authorities, hampered by vested interests, succeed only in clearing tiny areas often after years of negotiation. We know that pollution of the air is a serious evil to health, yet our laws make only the discharge of black smoke from a factory chimney an offence, and brown or yellow smoke may be emitted in any volume with impunity ; our methods of collecting dust are primitive, and we allow household refuse to be tipped into open carts, and dust-carts to pass through the streets at all times of day, filling the air with a cloud of filth at every gust of wind. We know that pure milk should be one of the staple foods of all young children, yet the reports of the Local Government Board show that something like 10 per cent of the samples analysed are adulterated, while 10 per cent contain the bacilli of tuberculosis. We know the harmfulness of eating adulterated food, yet adulteration was probably never more widespread than it is to-day, many of our commonest foods being habitually sophisticated, while the laws intended to prevent this practice are ineffective, and the penalties imposed upon offenders are usually quite inadequate. We deplore

the ignorance of mothers and we try to encourage breast-feeding, and at the same time we allow vendors of patent foods for infants to placard every hoarding with lying advertisements of their wares. We declaim against intemperance, while we permit 'medicated' wines to be sold widely to the ignorant under the pretence that they are beneficial to health. Our general water-supply and the drainage systems in most towns are in fact the only directions in which we have attained the standard of excellence demanded by modern knowledge. The provision for curative treatment is equally out of accord with what we know to be required. In spite of the good work done by the voluntary hospitals and many infirmaries, the numbers of beds available in institutions for the sick is insufficient to meet the needs of the community. The medical inspection of school children only covers a part of the field, and the arrangements for medical treatment of the children are still less complete. The more scientific methods for diagnosing disease, and the services of specialists in various directions are beyond the reach of large masses of the people; and the medical treatment provided through the Poor Law or Insurance systems is thoroughly unsatisfactory in many districts.

If the application of our knowledge bore a reasonable relation to its amount, we should have a vigorous and healthy population, whereas the true state of affairs is revealed by the returns of infant deaths, the deplorable condition of school children in towns, and the high proportion of would-be recruits who are rejected from military service. We are apt to get an exaggerated idea of the health of the people and of the effects of administrative measures which have been taken in the past, partly because nearly all our blue books and official reports on Public Health, issued by those responsible for the establishment or working of these measures, are distinctly partisan and often very unscientific in their statements and claims; [1]

[1] A well-known writer in *The New Statesman*, criticising the Second Annual Report of the Insurance Commissioners, says: "In short the Report is so successful in failing to afford any picture of how the Act is working, that we are driven to the inference that it has been no less successfully 'edited' with the intention of revealing no significant facts or crucial points that have not already been published in Ministers' answers to questions or otherwise." The Annual Reports of the

and partly because of the inveterate habit of politicians and reformers when speaking on Public Health to draw glowing comparisons with conditions in past times. We are continually reminded of the fall in the death-rate, the disappearance of typhus, and the decline in tuberculosis, for all of which credit is given without any hesitation to administrative measures, though, as we shall see in the next chapter, often with little foundation. But the past is not the right standard of measurement; comparison should be between what we do and what we might do if we made full use of our vast stores of knowledge. We have no more right to take credit because things are better than they were fifty years ago, than we should have if we armed our soldiers with muskets, and pointed with pride to the fact that they were a great improvement on bows and arrows.

The Reasons for the Failure

To trace the reasons for the failure to make the best use of medical and Public Health knowledge is the main object of this book. The task is not easy, for the factors operating are too diverse and yet too interwoven in their effects to permit of a simple scheme in setting them forth; moreover, it will be necessary as we go along to establish scientifically, as far as possible, various statements briefly summarised in the preceding pages, many of which will have appeared too sweeping at first sight.

Broadly speaking, the reasons why results in Public Health have been so incommensurate with efforts are three in number: viz. the opposition from vested interests; the complexity of Public Health administration; and the want of expert knowledge in those who frame the laws and those who administer them. Vested interests offer difficulty to Public Health progress in many directions. Reference is not made here to the unscrupulous member of a Local Authority or Board of Guardians who uses his position to further his own private ends, or to the dis-

Registrar-General and the scientific monographs on Public Health subjects issued from time to time by the Local Government Board must be exempted from the general criticism made in the text.

honest trader who adulterates the food he sells, but to the much larger legitimate interests which the sense of justice of the community, now or in past times, has decreed shall not be disturbed without due compensation. There is the landlord or house-owner, who is entitled to the highest rent he can get, although overcrowding and bad housing result; there is the Borough Councillor, himself often a tradesman, who, without any personal end, naturally inclines towards the protection of trade interests; there is the factory-owner, in whom it would be sheer altruism to do more for the health of his employees than is required by the law; and there is the doctor, who having built up a practice by his own efforts, fights legitimately against proposals to establish medical services which appear to threaten his interests. These are well-recognised instances, but in many less obvious ways vested interests, perhaps quite low down in the social scale, make their appearance and impede Public Health progress. Even the dustmen have successfully resisted innovations in the system of collecting dust which seemed likely to reduce their perquisites.[1] The effects of vested interests upon Public Health will be described in later chapters, but the methods of overcoming these interests, with due observation of the principles of justice, are economic questions which do not concern this book.

The complexity of Public Health administration is a result of the piecemeal way in which the Public Health system has grown up in this country. The health of the people and causes of disease have never been dealt with as a whole, but the legislature has at different times made provision for different groups of people and for treating different diseases; and as each new measure has been adopted, the duty of carrying it out has, in the absence of one central administrative authority, been thrust upon some Department perhaps established originally for a totally different purpose, or has been assigned to a new

[1] The authorities of a certain town recently proposed to establish a system by which a cart, especially built to hold a number of bins, would deposit an empty one at each house and take away the filled receptacle without its being opened. The dustmen, however, raised strong opposition, and it was found that they claimed as a perquisite the right to pick over refuse and take bottles, tins, etc. A strike was threatened, and the project was in consequence abandoned.

authority created *ad hoc*. The consequence is, that the central administration of Public Health is divided up among eight or ten different Departments, uncoordinated to an extent which is known only to those who have had actual experience in a Government Office. Some of these Departments do not know what the others are doing or have done; some are working in contrary directions; and sometimes they produce reports on the same matter leading to different conclusions, or sets of statistics hopelessly at variance with each other,—all factors which combine to produce friction, delay, and inefficiency. Locally, the confusion is repeated owing to the division of Public Health administration among Local Sanitary Authorities, Education Authorities, Boards of Guardians, Insurance Committees, etc. The needless multiplication of officials puts the country to unnecessary expense; and the long delays, the overlapping in some directions and the absence of control in others, the discouragement of effort, and the difficulty of defining responsibility, seriously prejudice the public welfare; while, in the chaos, vested interests, ignorance, and apathy find their season.

Want of knowledge among legislators and administrators is in some respects the greatest hindrance to Public Health progress, since it not only leads to costly and ineffective legislation, but tends to popularise erroneous views on the causation and prevention of disease, and obscure the real factors which are working. The science of hygiene is complex, and when its principles are grasped, the applicability of these principles to the populace demands further study. The practical effect of a particular step may be widely different from the result it should have in theory; and its actual results can often only be foreseen by those who have intimate knowledge and experience of the conditions and persons to whom it is to be applied. But Parliament has no special means of acquiring this knowledge, no body of experts from which it can obtain information or to which it can refer Public Health Bills for criticism. Sometimes it appoints a Royal Commission to investigate a particular point, a tedious and by no means always satisfactory form of

procedure; but often it appears to be believed that any one without any special knowledge or experience of the subject is competent to legislate upon the highly complex problems involved in Public Health measures. A Minister may introduce a Bill without any previous expert inquiry into its probable effects having been made; he may or may not consult some of the medical officers in the Government Departments, and if he does consult them he may disregard their advice without letting it be known that he is acting contrary to their opinion; the Bill passes through a House in which again it receives very little expert or scientific criticism, and its administration as an Act is entrusted to a Department of the Civil Service in which medical and scientific knowledge is only permitted to exercise a strictly limited and subordinate influence.

The result is that gross mistakes are made and huge sums spent for wholly incommensurate return. Parliament established a vast scheme for sanatorium treatment of tuberculosis at a time when investigation of German experience alone would have shown that this form of treatment is of very little value among working classes who continue to live under bad conditions; and in the same Act it endeavoured to set up a scheme for penalising persons responsible for sickness, which, as will be shown in a later chapter, is wildly impracticable. It forgot the existence of the Metropolitan Asylums Board, and it apparently did not know that maternity may be a cause of sickness. The mistake of taking sickness rates as the same for men and women was an elementary one which should never have been made, for every doctor could have furnished information that women, especially married women, suffer more from sickness than men; and though there were not sufficient statistics of sickness payments in existence to enable a precise actuarial estimate of the difference to be made, there were large statistics available of medical attendance upon members of Friendly Societies from which a very fair approximation of the difference could have been obtained.[1] These mistakes were made

[1] Mr. Roberts, the Chairman of the National Insurance Joint Committee, has recently given an entirely new and singularly interesting explanation of the way in which these two rates came to be taken as the same. Speaking in the House of

in the Insurance Act, but other errors will be indicated in the legislation relating to purity of food, infant mortality, and disease, while the errors of omission which permit grave abuses to continue unchecked year after year are even more serious.

Another effect of the doubt which Parliament feels in its competency to deal with medical affairs is seen in the growing tendency to make a broad statement in an Act and leave all details to be settled by an administrative Department, which thus comes to possess almost legislative powers. Parliament lays down that an insured person shall be entitled to 'adequate medical treatment,' without further qualifying the words or indicating their scope, and the Department which administers the Act proceeds in accordance with official tradition to give them the barest possible minimum of effect. The obscurity with which an Act may be drafted may also have serious consequences. Writing seven years after the passing of the Act for providing meals for school children, the Chief Medical Officer of the Board of Education says: "The Act of 1906 . . . was so worded as to make it at least doubtful whether they [Local Authorities] could legally provide children with meals on days when the schools were not open." [1] It is

Commons on June 20, 1916, he said: "In the case of the women there was no such statistical base to go upon. It is true that some facts were alluded to in the actuarial report, but they were imperfect; though they appeared to point to a rate of sickness similar to that of the men. Some precautions were taken, and the actuaries proposed that there should be a margin of 31 per cent above the figures shown, but the House of Commons during the stages of the Bill reduced the margin to 24 per cent. It has been proved, especially in the case of married women, that the excess is even higher than that, but before this House blames the Government for that, I would ask hon. members to recollect what the conditions were in 1911. In that year an agitation was raging in the country which, I think, would have fixed hold of my proposal to differentiate between men and women as a gross injustice. There were no facts available to justify such a differentiation which the actuaries could point to; if in spite of this the Government had decided to treat the women with far less liberality and generosity than the men, and if such a proposal had been brought down to the House of Commons, I do not think it would have survived an afternoon's discussion. That, I think, is the defence on that point."

This is a frank admission, which, while it exonerates the actuaries, illustrates the loose way in which Public Health measures may be dealt with. The Government apparently knew that their proposals were financially unsound, though they did not know precisely to what extent; but, influenced by a popular agitation, they preferred to over-ride expert opinion, keep their knowledge to themselves, and let it only be discovered later by experience, to the great embarrassment of Approved Societies.

[1] Annual Report for 1913.

pitiful to think that Parliament should not have made its intentions clear in a matter upon which depended whether or not many children should go hungry.

Many grave mistakes will yet be made in Public Health legislation, for medicine has far from reached finality, and the views held by the highest authorities to-day may be proved erroneous to-morrow. Much study is still required, and doctrines seemingly established for all time must continually be called in question, but we can at least secure that at any moment the best knowledge available shall serve as the basis of legislation. Our medical men, bacteriologists, professors of Public Health, experts in sanitation, and scientists do not want to order or control the lives of their fellow-citizens; but the representatives of those citizens will do well if they establish a system by which they can draw readily from the accumulated wealth of medical and sanitary knowledge before they legislate for the common good.

CHAPTER II

NATURE AND DISEASE

Evolution against disease: typhus; smallpox; enteric fever; scarlet fever; diphtheria; tuberculosis; syphilis—The problems of infection—The futility of disinfection—The assurance of the layman—The evils of exaggerated claims.

Evolution against Disease

In succeeding chapters we shall discuss the value of the efforts which have been made by the community to reduce or eradicate disease. It is important, however, as a preliminary step to study the great part which Nature herself plays in bringing about these ends, since, if this is not done, the mistake may be made of assuming that all diminutions of disease have been due to our own efforts, and this in its turn may lead to legislative and administrative action built upon false analogies and wrong inferences.

Silently, often unobserved, and often not understood when observed, Nature has for long ages been increasing men's power to fight against the diseases to which their environment exposes them; probably through a process of natural selection which results either in an increased degree of immunity against the disease, or in an increased capacity to recover from the disease when attacked. Various aspects of this evolutionary process have been dealt with by Metchnikoff, Karl Pearson, and others, and the whole subject has been examined in a masterly way by Archdall Reid. The process is most easily observable in native races, where the influence of Nature has not been overlain, or obscured, by the conscious action of the community. Among such peoples, diseases newly-introduced may have a devastating effect, though these same diseases are rela-

tively trivial among peoples who have had a long racial experience of them. Measles is a deadly disease among the Polynesian Islanders, epidemics sometimes decimating whole communities: vaccination is highly dangerous among the Esquimaux who have had no racial experience of smallpox, and die from the effects of even its attenuated form. A similar effect is seen in the increased mortality from tuberculosis of the negro, or the Kalmuck of the Russian Steppes, when brought in contact with civilisation in white men's towns. As Archdall Reid has pointed out, there is nothing mysterious in the disappearance of the Red Man, the South American Indian, or the Caribbean before the march of the white man; they have not died by the sword, nor from 'domestication,' but from inability to resist the sudden invasion of the white man's diseases. The same relative lack of resistance is exhibited by white men when exposed suddenly to native diseases; the British civil servant, for example, suffering far more from malaria in West Africa than the racially-acclimatised native.

Broadly speaking, the power of a race to resist a disease is proportional to the length of time the race has had experience of it; and there is no doubt that this evolutionary process has been going on as much among civilised as among native peoples. It has long been recognised that most infectious diseases tend in course of time to 'wear themselves out,' and the decline in virulence or extent of tuberculosis, syphilis, and other maladies must, in part at least, be attributed to this process. A shallow argument has been based upon these observations, viz. that our efforts to prevent and cure disease are unsound, and that we ought to leave natural selection unimpeded to work towards the evolution of a disease-free people. But to reason thus is to show entire misconception of the relations between heredity and environment in disease. Our right course is to study Nature in relation to each individual malady, and to make her yield up her secrets. Then we shall find that often we can work in co-operation with her, and indeed sometimes accelerate her efforts. An example has already been given in malaria. Nature, if

left unaided, would probably in the course of time eliminate this disease from the human race; but science has now furnished us with precise knowledge of its causes, and, if we can succeed in applying that knowledge sufficiently widely, we can probably do in a few years what would have taken Nature as many thousands.

The influence of Nature upon disease is not restricted to producing changes in the resisting power of human beings. There is good reason to believe that bacteria and other pathogenic micro-organisms themselves undergo evolutionary processes *pari passu*, and this further complicates the investigation of the essential causes and tendencies of diseases. Bacteriology is a new science, and much has still to be learnt about the changes which bacteria undergo even in comparatively short intervals of time; but of the experimental and clinical observations there is no doubt. In the laboratory bacteriologists can now raise or lower the virulence of infective organisms at will by passing them through various animals or subjecting them to certain processes. The study of epidemiology has shown that a pathogenic organism under natural conditions may exhibit a wide range in virulence. Some epidemics of a disease are attended by a high death-rate; others of the same disease, under apparently similar conditions, cause only a low death-rate, for no reason which we can suggest other than a change in the infecting organism itself. A severe epidemic of smallpox may be attended with a case-mortality of 30 per cent or more, while in other epidemics the disease may be scarcely distinguishable from chicken-pox, and in an epidemic in Sydney, in 1913, among a largely unvaccinated population, there was only one death in a thousand cases. Sometimes the virulence of a disease exhibits no constant trend, but varies from place to place and time to time; with other diseases the virulence may show a steady decline over a large area. A good example of the latter is afforded by the downward course of scarlet fever in England during the last twenty years, and probably on an even larger scale by the decline in tuberculosis in most civilised countries during the past half-century.

When two processes towards the reduction of disease, viz. the influence of Nature and the efforts of the community, are going on side by side, it must necessarily be at times very difficult to allocate to each its real share in the final result. Of some diseases we can speak with considerable assurance: we have little reason to doubt that the decline in the mortality from scarlet fever has been due chiefly to a natural process, or that the reduction of typhoid fever has been brought about mainly by our achievements in sanitation; but of most other diseases our knowledge is still too scanty for definite conclusions to be drawn.

The last fact is one which is not generally appreciated, with the result that when a disease is observed to decline, and when during the period of the decline measures have been in force intended to reduce that disease, the assumption is invariably made that the decline of the disease has been due to these measures; and therefrom the further conclusion is drawn that similar measures applied to other diseases will be equally beneficial. Claims which cannot be substantiated scientifically are continually made. Ministers when introducing Public Health measures in Parliament, and social reformers when urging Public Health changes, point with pride to the decline in the death-rate, and claim it as the result of sanitary efforts; though if this is the whole explanation, the rise in the death-rate which has occurred since 1912, and is likely to continue from causes wholly unconnected with sanitation, must equally be attributed to some failure to maintain these efforts. Similarly the disappearance of smallpox is ascribed without doubt to vaccination; typhus has gone because we have cleaned and purified our cities; the reduction of tuberculosis is due to improved housing, disinfection, etc.; and the decline of infant mortality is attributed to notification of births, instruction of mothers, and similar measures. The disappearance of leprosy alone is not claimed as a result of sanitary efforts, probably because it is too well known that the disease vanished long before there was any effective Public Health organisation in existence,

and while general conditions were still filthy and insanitary.

It is true that the standardised death-rate has fallen substantially in the last half-century. During the period 1866 to 1870 it averaged 21·2 per thousand, while for the years 1910 to 1914 the average was only 13·5 per thousand, but we cannot be dogmatic as to the causes of this decline. We do not know the extent of natural influences, and it is possible that modern surgery, which saves many thousands of lives annually, has played a larger part than sewers. It would be unjust to the memory of Chadwick, Farr, Simon, Shaftesbury, and other pioneers to underestimate the value of sanitation. But we now possess knowledge which was not open to these men, and we are no longer justified in generalising about disease in the way which was the only course possible half a century ago. We know now that different infectious diseases differ in their degrees of infectivity, and in the conditions under which they are conveyed to man, and that they demand different methods for their prevention. Notification and isolation have undoubtedly been valuable means of checking smallpox, but have been of no use in reducing the prevalence of scarlet fever or diphtheria ; and notification of tuberculosis has probably done more harm than good, since it has created a grossly exaggerated fear of infection in the public mind, has increased the difficulties of notified persons in getting work, and yet has not compensated us for these drawbacks by providing statistics of any value. Some of these statements are far from being in accord with popular opinion, and as they will be received with scepticism, it seems desirable to support them by tracing the course of the commoner infectious diseases in England and Wales during recent years, and quoting opinions of those who have closely studied their epidemiology.

Typhus is a disease which at one time was very prevalent in England and Wales, and its tendency to attack crowded aggregates of human beings is shown by its old names of 'gaol-fever,' 'hospital-fever,' and 'camp-fever.' Until 1850, when Jenner at the London fever hospital

confirmed the earlier work of Gerhard, Stewart, and others, typhus was not distinguished from typhoid fever, and it was not until 1869 that the Registrar-General separated the two diseases in his reports. Accordingly, our statistical knowledge of typhus only dates from that year. It was believed until recent years that typhus was transmitted through the air; and this was held to be supported by the observed fact that close proximity to infected persons greatly increased the risk of contracting the disease, judges and barristers often catching it from infected prisoners in court, while many doctors and nurses have died from the disease while attending patients. But we now know that the body-louse is the principal, if not the sole agent in the transmission of typhus, and nearness to an infected person increases the risk simply because it facilitates the passage of the louse from one person to another. Defective sanitation and bad housing, which are always held responsible, are not direct causes of the disease, any more than are swampy districts the cause of malaria, but only in so far as they militate against personal cleanliness and lead to overcrowding. Nor does a poor state of health from living in insanitary surroundings appear markedly to predispose towards typhus, for doctors and nurses suffer as severely as other classes. A writer on the subject many years ago pointed out that "close proximity to, and contact with the infected individual and his dirty belongings lead with great certainty, even under the best sanitary circumstances and in a healthy, well-fed people, to an attack of typhus."[1] According to Sir William Osler, no other disease has claimed so many victims among the medical profession.[2]

Typhus did not decline regularly in England and Wales, but fell very markedly and abruptly during the decade 1869–79. Its course since tabulation of the disease began is shown in the following table :—

[1] *Supplement to Forty-fourth Annual Report of the Local Government Board.*

[2] Under war conditions the mortality is often very heavy. Dr. Caldwell, Sanitary Commissioner to the American Red Cross in Serbia during the typhus epidemic in 1915, states that 160 members of the Serbian medical profession out of a total of 340 died from the disease. Doctors and nurses sent by other countries suffered as severely; five of the American physicians lost their lives, and in one Red Cross unit eleven out of fourteen nurses contracted the disease.

MORTALITY FROM TYPHUS: ENGLAND AND WALES

Year.	Deaths.	Year.	Deaths.
1869	4281	1885	318
1870	3297	1886	245
1871	2754	1887	211
1872	1864	1888	160
1873	1638	1889	137
1874	1762	1890	151
1875	1499	1891	137
1876	1165	1892	85
1877	1104	1893	137
1878	906	1894	115
1879	533	1895	58
1880	530	1896	71
1881	552	1897	49
1882	940	1898	47
1883	877	1899–1906	39 *
1884	328	1907–1914	11 *

* Annual Average.

It will be noticed that the mortality from typhus fell from 4281 in 1869, to 533 in 1879, and it is by no means easy to find a satisfactory reason for this large and rapid decline. Dr. Brownlee of the Medical Research Committee says: "I think the disappearance of typhus was "as much due to natural causes as to sanitary endeavour. "It is difficult to offer proof of either statement . . . , but "the fact that the disease disappeared from the West "Highlands and from the West of Ireland at the same time "as it died out in England, suggests that some change in "the organism was at least of as much importance as the "application of sanitary measures."[1] Dr. Bruce Low of the Local Government Board says: "It is not very "evident what has caused this very marked diminution of "typhus fever in England and Wales. No special measures "have been taken against the malady, beyond isolation of "cases in hospital and disinfection of dwellings and, in "later years, of clothing and bedding. The decrease of "typhus fever in this country has, however, followed close "upon the march of sanitary progress subsequent to the

[1] "Periodicity of Infectious Diseases," *Public Health*, March 1915.

145574

" passing of the Public Health Acts of 1872 and 1875." [1] The last sentence, though very cautiously worded, might be taken to suggest that these Acts had played a part in bringing about the reduction, but it is difficult to see that this could have been the case. A substantial fall had occurred before the earlier of the Acts was passed, and for the first few years the working of these Acts was very incomplete. It is on record for example that the great majority of the Medical Officers of Health first appointed were simply part-time general practitioners, who could not have had special knowledge of sanitation. Moreover, we know that the primary agent in the transmission of typhus, the body-louse, is to this day widely prevalent in the poorer quarters of all large towns. With so much uncertainty as to the causes of the decline, it may be suggested that if about 1870 any process of protective inoculation against typhus had been widely adopted, it would almost certainly have been claimed as the cause of the reduction, and we might still be insisting upon the observation of such a measure.

These considerations show that we are dealing with a very obscure problem. It is difficult to believe that a change in the resisting powers of human beings can have occurred in so short a space of time, but the rapid multiplication of bacteria, which compresses many generations into a short interval, renders quite conceivable a change in the virulence of the organism ; nor is it outside the range of possibility that there has been a change in the constitution or habits of the louse itself. We have still much to learn, but we probably now know sufficient to prevent an epidemic of typhus from ever occurring again in this country. The disease, too, is one which has ravaged armies in the past, and we can justly take credit for the almost complete freedom from it of our troops in the present war, even under conditions favourable to an outbreak ; but the claim, so often made in an eloquent peroration, that " the disappearance of typhus is one of the greatest triumphs of modern medicine " cannot be substantiated by scientific investigation.

[1] *Supplement to Forty-fourth Annual Report of the Local Government Board.*

Smallpox has been the subject of long and bitter controversy regarding the causes of its decline. No reasonable person, reading impartially the history of this terrible disease, can doubt that vaccination played an appreciable part in reducing its prevalence; but it is open to argument whether this precaution is still essential purely as a prophylactic, though it is of course important during an epidemic among persons brought in contact with the disease. When vaccination was first established in this country, sanitation was still very defective, clinical knowledge was not nearly so great as at present, doctors might easily overlook anomalous or slight cases, and the facilities for isolation and treatment were wholly inadequate. Under these circumstances it was of great value. But we now have more skilled diagnosis, and facilities for prompt isolation of infected persons and those who have been in contact with them. As year by year the proportion of unvaccinated persons in the community increases without serious epidemics, the opinion steadily grows that rigid enforcement of these measures is sufficient to prevent an epidemic if the disease is accidentally introduced. Dr. Millard, the Medical Officer of Health for Leicester, has ably stated the arguments in support of this view.[1]

But while admitting the great value of vaccination in the past, we cannot ignore the possibility that natural influences have contributed to the reduction of smallpox. Dr. Thomas Gibson, the Medical Officer of Health for Wakefield, says: "The slackening off in the law with regard to vaccination which has been a feature of recent years, is, I am sure, viewed with considerable misgiving by most of us. At the same time, having regard to the modifications which diseases appear to undergo in the course of time, I am not sure that it is wise to prophesy as some do the certainty of a terrible retribution for the increasing neglect of vaccination. To refer back to typhus for a moment, although that disease was one strikingly associated with privation and overcrowding, I am not at all satisfied that the improvements in the economic and housing conditions of the people have been

[1] *The Vaccination Question in the Light of Modern Experience*, 1914.

in themselves sufficiently great and potent to account for the very marked reduction in the prevalence of the disease. It is more likely that improved sanitation has acted as a powerful auxiliary to a natural tendency in the disease to die out—call it immunity or what you like,—and it is just possible that vaccination has been working alongside and augmenting in the process of time a similar tendency in smallpox." [1]

Enteric fever was responsible in 1874 for a mortality of 374 per million living, but the death-rate has fallen almost uninterruptedly since that year, and in 1914 it was only 46 per million. The decline in this disease is perhaps our greatest and most definitely-proved achievement in sanitation. Enteric or typhoid fever is probably almost solely conveyed by food or water, and the establishment of a pure supply of drinking-water has been by far the greatest factor in its diminution. During recent years we have learnt that certain persons termed 'carriers,' who are apparently in good health, but are chronically infected with the organisms of the disease, may act as centres of infection, particularly if they are employed as milkmen, cooks, etc., in the handling of food. The difficulty of dealing with these persons is very great, but were it not for this source of infection, typhoid fever would possibly be completely stamped out in England in the course of a few years.

Scarlet Fever.—The death-rate from this disease has been steadily and rapidly falling for the last fifty years, having been 960 per million persons in England and Wales during the period 1866–70, and 63 per million during 1910–14. There are good reasons for believing that this decline has been due mainly to a change in the virulence of the organism ; but to examine this point it is preferable to deal with a group of the population which has been more or less under constant conditions, and to state the mortality in terms of the number of cases of the disease, since this eliminates variations due to its varying prevalence from year to year. The cases treated in the hospitals of the Metropolitan Asylums Board form a useful unit for this

[1] *Public Health*, April 1915.

purpose, and the steady decline in the mortality among these cases is shown in the following table :—

SCARLET FEVER : MORTALITY PER CENT OF PATIENTS TREATED IN THE M.A.B. HOSPITALS

Year.	Case Death-rate per cent.	Year.	Case Death-rate per cent.
1875–1879	13·5	1897	4·1
1880	12·3	1898	4·1
1881	11·1	1899	2·6
1882	10·4	1900	3·0
1883	12·4	1901	3·8
1884	12·3	1902	3·4
1885	9·5	1903	3·1
1886	9·0	1904	3·4
1887	9·5	1905	3·3
1888	9·9	1906	2·9
1889	8·9	1907	2·8
1890	7·9	1908	2·6
1891	6·7	1909	2·3
1892	7·3	1910	2·3
1893	6·1	1911	1·9
1894	5·9	1912	1·6
1895	5·4	1913	1·2
1896	4·3	1914	1·4

It will be noticed that since 1884 there has been an almost uninterrupted fall in the case death-rate; and in thirty years scarlet fever has become a less deadly disease than either measles or whooping-cough. This change has occurred in persons drawn from the same districts, living under practically constant conditions and treated in essentially the same manner. There has been no great medical discovery for the treatment of scarlet fever such as has been made in the case of diphtheria, and indeed, in uncomplicated cases, there is very little opportunity for purely medicinal treatment, the essential conditions for recovery being skilful care and nursing; nor can the decline be attributed to improvements in the latter, for the high standard of nursing established quite early in the Board's hospitals left little scope for advance. It is as certain as anything in medicine can be, that the decline in the mortality from scarlet fever has been due to some

change in the infecting organism which has appreciably reduced its virulence.

Diphtheria is another infectious disease which has shown a great decline in mortality during recent years, but the causes of the decline appear to be very different from those which have reduced scarlet fever. Up to 1895 the case death-rate from diphtheria in the hospitals of the Metropolitan Asylums Board ranged from 23 to 59 per cent, but about that year the modern antitoxin treatment which had resulted from the labours of Klebs, Löffler, Behring, and others was introduced, and in the succeeding years a rapid fall occurred in the mortality, which in 1914 was only 7·9 per cent of the cases treated. Just as we may take credit for the decline in typhoid fever as our greatest sanitary achievement, so we may regard the decreased mortality from diphtheria as one of the most successful results of purely clinical medicine.

The question may legitimately be asked: Why should not the decline in mortality from diphtheria also have been due to a lessening of the virulence of the organism which has happened to coincide with the introduction of a new treatment, and has accordingly led to the credit being given to that treatment? The answer is that in patients who do not receive the antitoxin treatment, the disease exhibits a virulence fully as great as that of twenty years ago. Further, there is a very marked relation between the mortality-rate and the period in the disease at which the injection is given; the earlier the day and the shorter the time the bacteria have had to generate their toxin, the more potent is the effect of the antitoxin. It is certain that if all cases of diphtheria could be treated shortly after infection, the mortality would be further substantially reduced.

Tuberculosis.—There is no disease exact knowledge of which is so important as tuberculosis, for it is the most widespread and deadly affection now existing in this country, being responsible for nearly seventy thousand deaths in the British Isles every year, and a far larger number of cases of sickness. Tuberculosis has exhibited a marked decline in nearly all civilised countries during

the last half-century, and in England and Wales the annual death-rate from all forms of the disease has fallen from 3479 per million during the years 1851–60, to 1344 in 1914. There is no reason to doubt that this decline has been assisted by diminution of overcrowding, clearing away of slums, and enforcement of precautionary measures in unhealthy trades; although the value of the measures adopted in recent years, viz. notification of tuberculosis and sanatorium benefit, is more open to question.

The tendency to claim that the decrease in mortality has been due to social measures is perhaps more strongly exhibited in the case of tuberculosis than in any other disease; nevertheless this claim is by no means fully endorsed by scientific research, and bacteriologists incline more and more to the view that natural processes have played a considerable part in bringing about the decrease. Professor Hewlett says: "Tuberculosis is diminishing "among the white races; it is, however, spreading among "many coloured races. It is to be noted that the decline "began long before the germ origin had been demonstrated, "and what is more, the rate of decline was almost as great "before any administrative measures were taken against it "as since."[1] The marked decline in the death-rate from phthisis in Edinburgh which followed the establishment of the dispensary system was unhesitatingly attributed to that system, which accordingly became a model for other localities. Unfortunately for this view the death-rate in Aberdeen—without any dispensary—fell to a greater extent during the same period. Professor Karl Pearson, who has very ably analysed these and other statistics relating to tuberculosis over a long period, sums up his conclusions by saying: "It seems to me that when we study the "statistics of the fall of the phthisis death-rate, when we "notice this fall taking place in urban and in rural districts, "when we see that it started long before the introduction "of sanatorium and dispensary work and that it has not "been accelerated by modern increase of medical know-"ledge, then we are compelled to regard that fall as part of "the natural history of man rather than as a product of his

[1] *Manual of Bacteriology*, 5th ed., 1914.

" attempt to better environment."[1] Professor Karl Pearson has argued strongly that an hereditary influence is the main factor, those persons who have inherited a predisposition towards tuberculosis being particularly liable to the disease. Metchnikoff, following the suggestion of Roemer, has found increasing support among scientific men for his view that the great majority of town-dwellers have already suffered from an attenuated form of tuberculosis, and have thereby acquired varying degrees of immunity against the disease which have helped to bring about the decline. After pointing out that " the systematic researches made " by Dr. Naegeli and confirmed by other pathologists have " demonstrated that nearly all human beings, dead from " other causes than tuberculosis, present, in some part or " other of their organism, latent and more or less extended " lesions due to tuberculosis," Metchnikoff says : " I hold " that in addition to rational hygienic measures, the un- " conscious immunisation of the population by the tuber- " culous vaccines scattered around us must play an im- " portant part in causing the diminution of the annual " death-rate due to tuberculosis. . . . Just as the Kalmuk " children easily take tuberculosis in the cities when by " the side of their European comrades who remain free " from it, so persons who come into the great centres of " typhoid fever very frequently contract this malady whilst " the original inhabitants of the country continue to enjoy " good health. . . . These indications suffice to show the " great importance of discovering the natural processes by " which man acquires immunity against infectious diseases " in general and against tuberculosis in particular." [2]

Syphilis is a disease of which we have not much accurate and reliable statistical knowledge, but according to evidence given by numerous witnesses before the Royal Commission on Venereal Diseases, there are good grounds for believing that it has been declining both in frequency and virulence for many years. Older physicians say that the terribly severe types of cases met with a generation ago are now much less frequently seen, even among patients

[1] *Tuberculosis, Heredity, and Environment*, 1912.
[2] *The Warfare against Tuberculosis*, Bedrock. January 1913.

who have received no treatment; and the worst forms of the disease are encountered among native races. The lessened frequency of syphilis is very probably due to greater care and cleanliness and a higher moral standard; but the diminished severity must almost certainly be attributed to the natural tendency exhibited by so many diseases to die out in the course of time.

This brief summary, which has not attempted to do more than touch upon the scientific knowledge relating to the natural history of disease, shows that the question as to why a disease decreases is often very obscure. Under these circumstances the scientific investigator hesitates to undertake the thankless task of opposing popular opinion, when he can only support his views by scientific arguments and statistics which the average person has neither time nor inclination to study; and the layman accordingly cannot be reproached for making dogmatic statements and jumping to conclusions which are not substantiated by science. It might be said that the question is of purely academic interest, and that so long as a disease disappears it does not much matter whether it be due to a natural process or social measures. But if these measures are based upon erroneous beliefs they are apt to be wasteful and sometimes actually harmful; their apparent success leads to similar measures being applied to other diseases; and they set up false views and theories which distract attention from the real agencies at work.

The Problems of Infection

The discovery that infectious diseases are caused by the transmission of micro-organisms from one person to another has been of incalculable value in the progress of medical science. As we have seen, the fact that isolation of persons suffering from certain diseases was an efficient method of checking the spread of these diseases, was observed in remote times. The demonstration of the germ origin of disease provided a scientific explanation of the observed facts, but it also led to the belief that isolation would be an effective method of preventing the

spread of any infectious disease. We now know that this view is no longer tenable, and we have learnt that the methods satisfactory for dealing with one disease are by no means as suitable or satisfactory for another. In the popular mind all infectious diseases are more or less alike, and infection through the air is generally believed to be the most frequent mode of transmission; but science has taught us that we cannot generalise in this way, and has shown us that some diseases are conveyed through food and water, some by animals, some by insects, some possibly through the air (though this is not proved even in the case of tuberculosis), and some only by direct contact between man and man; while in regard to others we must frankly admit that we do not know their mode of transmission.

When diseases are governed by such diverse conditions, it is obvious that methods of prevention which will succeed with one will not necessarily do so with another, and the argument from analogy may lead us into serious errors. We have for example good reason for believing that prompt isolation is a valuable means of preventing the spread of smallpox. Almost every year a few cases of smallpox occur in this country, generally introduced at the sea-ports, and when they are detected, persons suffering from the disease are at once isolated, and those who have been in contact with them are also isolated or kept under close observation. The fact that it is now a good many years since an epidemic of any size has occurred, appears to show that these measures are sufficient.

On the other hand, isolation of patients suffering from scarlet fever or diphtheria appears to have had no effect upon the prevalence of these diseases. Unfortunately our statistical knowledge for England and Wales relating to the prevalence (apart from mortality) of scarlet fever and diphtheria does not go back earlier than 1911, for although these diseases were made notifiable in 1889, it was not until 1911 that the Local Government Board compiled and issued statistics relating to the whole country. The following table shows the course of these diseases in England and Wales since that year :—

Notifications of Scarlet Fever and Diphtheria in England and Wales, 1911–1915

Year.	Scarlet Fever.	Diphtheria.
1911	104,651	47,802
1912	107,508	44,754
1913	130,707	50,903
1914	165,045	59,357
1915	127,086	53,597

In Scotland there has been the same upward tendency in the prevalence of these diseases accompanied by the same marked decline in the case-mortality: in 1914, notifications of scarlet fever were 27,321, of which 21,942 were admitted to hospital; and notifications of diphtheria were 9667, with 7904 admissions. In Ireland, case death-rates are not available; the rates per 100,000 of the population are low for both diseases, but that for scarlet fever has risen considerably in recent years.

It may be said that these figures do not afford a justifiable test of the value of isolation, since some of the patients will have been treated at home, and not at the fever hospitals; but this, at most, only applies to the degree of isolation, for even when patients are attended at home precautionary methods are adopted, the patient being isolated in a room, a sheet saturated with carbolic acid often being hung outside the door, and the room and bedding being disinfected under the instructions of the Medical Officer of Health. As regards this point, the statistics relating to London are important, since nearly 90 per cent of cases of scarlet fever and diphtheria notified are now received into the hospitals of the Metropolitan Asylums Board, and these statistics have the additional value of going back to an earlier period than those for England and Wales. The following table shows the number of cases of scarlet fever and diphtheria which were notified from 1890 to 1914:—

[Table

Notifications of Scarlet Fever and Diphtheria in London

Year.	Scarlet Fever.	Diphtheria.
1890–1899	21,240*	10,506
1900–1909	18,144*	8,679
1910	10,509	5,494
1911	10,483	7,385
1912	11,321	7,106
1913	17,544	7,650
1914	25,048	9,149

* Annual average.

It will be seen that compared with the decade 1890–1899 there has been some decline in the incidence of both diseases, the lowest point having been reached for diphtheria in 1910 and for scarlet fever in 1911 ; but since those years the numbers have risen steadily, and the high figures for 1914 show how far we are from ' stamping out ' these diseases. The fluctuations in scarlet fever and diphtheria suggest that their prevalence is dependent upon some factor or factors, possibly meteorological, of which we are still in ignorance. In any case it may be noted that although probably a larger proportion of cases are treated in the isolation hospitals in London than in any other district, the incidence of diphtheria has been higher in London for each year since 1911 than in any other part of England ; while for scarlet fever London was highest in 1914, and was exceeded only by the aggregate of County Boroughs during the three preceding years. It is clear that isolation is having very little influence on the prevalence of these diseases.

But though the fever hospitals have thus failed in their primary purpose of stamping out infectious disease, it must be fully recognised that they have been of great service in providing efficient care and treatment for a large number of persons who would not have been satisfactorily looked after at home ; and this is therefore the real standard by which the value of the fever hospitals must be judged. We must almost certainly abandon the hope of stamping out disease through their agency, and

must look upon them purely as curative institutions just as other hospitals. But as soon as this is recognised, the question arises whether by restricting admission to the fever hospitals to certain types of diseases we are making the most economical use of these institutions. The criterion for admission is not severity of illness, but the fact that the person is suffering from a scheduled disease. As regards scarlet fever, we know that a large number of beds are occupied by persons who are relatively not seriously ill, and who need little in the way of purely medical treatment; on the other hand, the institutional provision for general diseases is still very inadequate, particularly outside London, and many persons cannot obtain admission to a hospital although they may be far more in need of institutional treatment than some of those in the fever hospitals. We have reason to think now that measles and whooping-cough are worse diseases than scarlet fever, though we cannot be dogmatic on this point, since there is no means of determining their case-mortality. Among 3400 cases of measles admitted to the Metropolitan Asylums Board in 1913, the death-rate was 11·3 per cent, and among 1044 cases of whooping-cough it was 12·8 per cent, being thus for each disease approximately ten times as high as the death-rate from scarlet fever, but the comparison is not entirely legitimate, since the scarlet fever admissions were of all types, while those for measles and whooping-cough were probably particularly severe cases. If milder cases of scarlet fever were treated at home, more space would be available for admission of severe cases of measles and whooping-cough; while it might be to the advantage of the community as a whole to devote some of the fever hospitals to tuberculosis or general diseases. It must be remembered that since there is a marked seasonal variation with most infectious diseases, the prevalence usually rising rapidly during the Autumn months, many of the beds in the fever hospitals are unoccupied for considerable portions of the year. In London the Metropolitan Asylums Board provides 6825 beds in its eleven hospitals for ordinary infectious diseases, but on January 1, 1913, only 4087 of these were occupied.

These considerations show the need of dealing with disease as a whole, instead of making separate provision for each malady or type of malady, or class of persons. At present we have separate schemes for the treatment of tuberculosis, venereal diseases, infectious diseases, diseases among the infirm poor, and diseases in school children, with the result that some diseases receive more attention than their degree of seriousness really demands, while others are comparatively neglected. We find one authority building or enlarging a hospital or sanatorium, while another in the same district has many empty beds. If in each district there was a single authority which had complete control over all the provision for treatment of disease, this provision could be adjusted to meet the needs of the community far better than they are provided for at present.

We have digressed somewhat from the main subject of this section, which is the problem of infection. In tuberculosis this question is of particular importance, because a very large part of the modern campaign against tuberculosis is founded upon the belief that it is a seriously infectious disease. Tuberculosis is notifiable, the Local Authorities disinfect rooms and bedding which have been occupied by a patient, and Tuberculosis Officers are now developing a system of examining persons who have been in contact with sufferers from the disease. In the public mind the belief is firmly established that tuberculosis is readily transmitted from one person to another, and that prevention of infection is the great weapon against the disease. It has even been urged that tuberculous persons should be segregated from the general community or placed under restraint; the Vice-Chairman of the Lancashire Insurance Committee, for example, writes: "So long as consumptives are permitted freedom to live and move without restriction, so long will there exist an active agency spreading the disease and negativing all the efforts otherwise made to combat it."

We have still a great deal to learn about tuberculosis and infection, and a dogmatic attitude is unjustified; yet reflection will show that the infectiousness of tuberculosis

must be of quite a different order from that of scarlet fever, diphtheria, or smallpox, and is probably more comparable with infection by the organisms of pneumonia, or the ordinary pyogenic or pus-producing organisms which have never given rise to popular fear of transmission from man to man. We know that healthy persons can expose themselves continually to the risk of infection without acquiring the disease; doctors and nurses in sanatoria associate freely with patients for years and yet rarely develop tuberculosis; and it is not even thought necessary in the wards of general hospitals to separate tuberculous cases from other patients. Dr. Goring has investigated the incidence of tuberculosis between husbands and wives where, presumably, the greatest opportunity for infection exists, and he finds that in the poorer classes there is no greater chance of the mate of a tuberculous person being tuberculous than any other person. Among the wealthier classes the proportion is slightly greater, probably due, as Professor Karl Pearson has pointed out, to selective mating, an influence only likely to operate among educated people.[1] Sir Hugh Beevor, physician to the City of London Hospital for disease of the chest, protesting as far back as 1892 against exaggerated statements of the infectivity of tuberculosis, said: "The "term 'infection' is too loose a term to apply to both "measles and tuberculosis. When its use does damage to "the workman's prospects it is perpetrating an injustice "upon him. When we see the poor results in the isolation "of infective fevers by hospitals for fever, those who rank "tubercle as most highly infectious must seriously doubt if "it is a right policy to apply such a system to tubercle. . . . "I earnestly hope that the medical profession at large will "not encourage the public to avoid their tuberculous fellow-"creatures. . . . I would urge you as the educators of the "public in these matters distinctly to let it be known that "tubercle is not highly infectious. State that it is not "a disease that requires isolation, and that only under "certain quite exceptional conditions does it appear to be "infectious at all. Insist that healthy people enjoy extra-

[1] *Op. cit.*

" ordinary immunity, that fresh air and open windows are " the great armour against its attacks." [1]

Finally, it may be noted that the Royal College of Physicians has thought it desirable to issue a special report on the infectivity of tuberculosis in order to counteract the excessive fear of infection by the disease which exists among the public.[2]

We may consider another aspect of the question. The bacillus of tuberculosis appears to be so ubiquitous that it seems probable that all town-dwellers at all events receive the organism again and again into their lungs or alimentary system. If the bacilli are air-borne, we have only to consider the condition of the streets to realise the frequency of opportunities for infection; and if they are conveyed by food we may note that something like 10 per cent of the samples of milk analysed contain the bacilli of tuberculosis, and everywhere we see pastry, sweets, and other eatables exposed for sale in shops thronged with passers-by, or exposed to dust from the streets. Even the opportunities for almost direct infection are not rare. It is a common practice for a shop assistant to moisten his finger in order to take up a paper bag, and blow into the bag to open it before he puts an article of food into it; a railway clerk will often hand out a ticket moist with saliva, and a lady may be seen to place this ticket straight in her mouth while opening her purse. Public telephones, drinking-fountains, and the practice of licking stamps and envelopes, are other conceivable channels of infection. Finally, it may be added that many of our domesticated animals suffer from tuberculosis. It is clear therefore that if tuberculosis were infectious to anything like the degree exhibited by the ordinary infectious fevers, and the disease resulted simply from the entry of the bacilli

[1] *The Problem of Infection and Immunity in Tuberculosis.* An address delivered before the West Somerset Branch of the British Medical Association. 1902.

[2] The resolution of the Royal College which preceded the issue of the report was as follows: " That in view of the exaggerated fear of the infectivity of pulmonary tuberculosis entertained by the public, the consequent unnecessary disabilities imposed upon sufferers from the disease, and the opposition raised in many places to the establishment of institutions for its detection and treatment, a reassuring statement with regard to the degree of danger attaching to contact and communication with tuberculous persons be prepared by the College and issued in its name at an early date."

into the system, the whole population would probably be swept away.

Why then do some people exhibit the disease in severe form and others not ? The answer is that it depends much less upon infection than upon the power of resistance of each individual to prevent that infection gaining a hold on his system when the bacilli are swallowed or inhaled. As we have seen, it may be that the great majority of town-dwellers have actually been infected with the disease and have thereby acquired partial immunity, and it would appear that this infection occurs quite early in life. Investigations made by many observers among children by means of the Von Pirquet reaction—a very delicate test for discovering the disease — have shown that over 90 per cent of children have already suffered from tuberculosis. It is possible that tuberculosis is really a disease of childhood, like measles or whooping-cough, but that in early years it is a comparatively slight affection, the true nature of which is rarely recognised. But while these questions are uncertain, there is no doubt whatever about the environmental factors which lessen resistance. We know that a healthy person living in a healthy environment is unlikely to develop the disease even though frequently exposed to infection, and we know that the disease flourishes among those who are overcrowded, breathing foul air and insufficiently fed. Instances are sometimes brought forward of a number of persons living in the same area or street or even house who have developed tuberculosis, and it is claimed that these illustrate the danger of infection. It may be literally true that these persons have infected each other, but the reason why they have acquired the disease is almost certainly that the powers of resistance of all of them have been reduced by the same bad surroundings. On theoretical grounds fighting the disease by disinfection is sound, inasmuch as if there were no tubercle bacilli there would be no tuberculosis; but the occasional disinfection of a room, and the removal of a few cases to hospital or temporarily to sanatoria, are probably as effective as would be efforts to keep dry on a rainy day by wiping the paving-stones. The modern belief in the

dangerous infectiousness of tuberculosis is diverting attention from the main cause of the continuance of the disease, which is a bad environment. This influence was well known long before the tubercle bacillus was isolated, but efforts to reduce it seem now to take the second place, and attention is concentrated on prevention of infection.

It may be noted that many of the arguments for attacking tuberculosis by destroying the bacilli can be applied to all microbic diseases. Pneumonia, for example, resembles tuberculosis in many respects. It is a bacterial disease, it is far more prevalent in urban than in rural areas, and susceptibility to it is increased by exposure, under-feeding, alcoholism, and other influences tending to lower vitality. But no fear of infection by pneumonia exists in the public mind, notification is not required, and the Medical Officer of Health does not disinfect rooms which have been occupied by patients or examine 'contacts.'

Similar problems and uncertainties arise with other infectious diseases. Dr. Hamer, the Medical Officer of Health to the London County Council, has discussed the etiology of typhoid fever and has shown that some at least of the commonly accepted views of its modes of transmission cannot be regarded as scientifically proved.[1] He has also described the history of a girl, known to be a diphtheria 'carrier,' who was kept under observation for six years, but to whom no outbreak of the disease could be attributed; a case which raises doubt whether carriers form an important factor in the spread of diphtheria.[2]

There is reason, moreover, to believe that the methods of fumigation so widely employed are entirely useless to disinfect rooms. Dr. Walcott, the State District Health Officer for Massachusetts, has described a series of experiments, extending over more than a year, which he and his staff made to test these methods. They smeared pieces of cotton wool and other materials with infective material from the noses, throats, and ears of persons in the contagious diseases wards and from suppurating wounds in other wards, and put these on the floor, the table, chairs,

[1] *Annual Report* for 1914. [2] *Annual Report* for 1915.

mantelpiece, etc., of a room at various elevations, a control series being placed in another room. The room was then fumigated with every known method of fumigation, for example, sulphur candles, sulphur powder, formaldehyde, etc., and all proprietary remedies. The room was then sealed up and left for periods varying from 24 to 72 hours. It was found that these methods had no consistent effect upon the cultures used. "In one case of a proprietary preparation where one candle was guaranteed to kill every germ in a given room we made a little shrine of several of these candles and put the inoculations in the centre, and the germs lived happily through the experiment." [1]

As a result of these experiments fumigation has been abandoned by the Public Health authorities in New York, Boston, and other American cities

The Assurance of the Layman

The object of discussing somewhat fully in the preceding pages the factors which influence infectious diseases has been to show that obscurity and doubt exist on many points of fundamental importance. Scientific men hesitate to distinguish between the influence of nature and the influence of social effort; they are often uncertain of the methods of transmission of diseases, and they cannot be dogmatic as to the best ways of eradicating these diseases. More research is required in every direction, not only medical but sociological; and a humble though hopeful attitude is the only one which befits the scientific investigator. But we find no echo of this doubt in the utterances of our Ministers and legislators, who prepare and carry through vast schemes for the lessening of disease. The entire fall in the death-rate is boldly claimed as a result of legislative and administrative measures, and the disappearance or diminution of every disease is attributed to similar efforts. In an ordinary person these errors would not seriously matter, but when made by some one in high authority they may lead to the adoption of a wrong and costly policy. Since the main object of this book is to

[1] *Boston Medical and Surgical Journal*, March 9, 1916.

establish the case for putting our Public Health affairs in the hands of those who have real knowledge of the subject, it is necessary to justify this statement by quoting views which have been expressed by persons in authority. Many instances will be given in succeeding chapters, but here, for example, we may quote from an address on Public Health made by the Right Hon. John Burns as President of the Local Government Board at the International Congress of Medicine in 1913, to an assemblage containing many of the most learned and distinguished medical men from all civilised countries. The right hon. gentleman said :—

When speaking of the marvellous reduction that has taken place in the death-rate in this country, one is perhaps too apt to remember only social and sanitary progress as the explanation of this great change. My address to you to-day may, I trust, serve to show the appreciation by the public of the fact that to a very large extent humanity is indebted for the saving of life and of suffering that has occurred, to the vast improvements in the science of cure as well as of prevention of disease.

The Past Saving of Life.—Some conception of the progress already secured by the application of science, especially medical and sanitary science, to the problem of healthy living—and I trust at the same time to further triumphs on the part of your profession—may be given by the comparison to which I invite your consideration of the average experience of England and Wales during the three years 1909–11 as compared with its experience during three years based on the average experience of 1871–80. In the three years 1909–11, 1,529,060 deaths occurred in England and Wales. This number is 772,811 fewer than would have occurred had the average death-rate of 1871–80 held good for these three years. The saving of life in three years under special diseases is set out below :

Smallpox	25,463
Measles	7,824
Scarlet fever	69,974
Whooping-cough	30,884
Fevers (typhus, enteric, etc.)	45,339
Puerperal fever	3,941
Diarrhœa, dysentery, and cholera	32,996
Pulmonary tuberculosis	114,799
Other tuberculous diseases	36,338
Total saving on these diseases	367,558

Nearly half the total saving has occurred under the heading

of the diseases enumerated. If we take the whole of the thirty-two years, 1881 to 1912, and consider the saving of life during this period, the figures are truly colossal. The saving of life represents a population which is nearly equal to the total population of London or Australia or of Ireland and more than that of Switzerland.

How has the saving of life already achieved been secured? No complete answer can be given in a few sentences, and perhaps my best plan is to procced by examples, drawing inferences from the historical facts of medicine which are open to the layman as well as to the doctor.

The speaker then dwelt upon the work of Howard, Elizabeth Fry, Sadler, Oastler, Shaftesbury, Dickens, Owen, Kingsley, and particularly Chadwick and Southwood Smith; and he referred to the beneficial work of factory inspectors, medical officers of health, and sanitary inspectors in laying the foundations of national health. He continued :—

Typhus Fever.—The history of typhus is a romance in sanitation, from which the principles and practice of preventive medicine could be adequately taught. It occurred under conditions of dirt and overcrowding; but, apparently, it arose only by direct infection from person to person. It was spread like smallpox, by vagrants from parish to parish, repeatedly brought by them from Ireland to England, and it was not brought under control until the migrations of vagrants had been limited, the sick had been segregated in hospitals from the healthy, 'contacts' had been kept under adequate supervision, and the houses harbouring the disease had been disinfected and the vermin therein destroyed. In many instances the courts and alleys, the favourite lurking-places of the disease, were also swept away. Consider the following figures: In the ten years 1871–80, in Ireland, 7495 deaths were returned as due to typhus fever; in the three years 1909–11 the number had fallen to 143. In England and Wales, in the ten years 1871–80, 13,975 deaths were caused by typhus fever; in the three years 1909–11, with a much larger population, the number was 30. . . .

Stages in Registration of Disease.—The history of registration of disease is inseparably associated with that of public health. . . . You will, I think, agree with me that the most important extension of the principle of notification has been in regard to tuberculosis. The knowledge that this disease is communicable, and the importance, even apart from the fact of communicability, of having exact knowledge of its special haunts, and of its prevalence in different industries, and among the poor living in crowded streets and courts, have enabled me step by step by means of Departmental

Orders to apply the principle of compulsory notification to all forms of this disease. . . .

Tuberculosis is the one disease in which the fact that measures of treatment and of prevention are to a large extent identical is becoming fully realised. . . . Improvements in housing, progress in average social conditions, higher nutrition, all have doubtless borne their share in bringing about this great reduction in tuberculosis. More cleanly habits of the people must be given a large share in securing the result. The habit of indiscriminate spitting, although still prevalent, is much less so than in the past. The standard of domestic cleanliness has improved, and this must have cleaned out many of the former centres of infection. Even more importance must be attached to the diminished overcrowding of bedrooms. . . . The proportion of the total population in England and Wales living in rural districts has decreased from one-half to less than a quarter between 1851 and 1911. It is evident, therefore, that some important influences have been at work counteracting the effect of urban conditions as a whole on tuberculosis. Among these, important place must be given to the hygienic effect of the stay for months in an infirmary or hospital of a high proportion of the total consumptive population, at the most infectious and helpless periods of their illness. At the present time the prospect of complete control over tuberculosis is more promising than ever before. Not only is public administration, with its magnificent past effect on tuberculosis, becoming increasingly efficient; but the National Insurance Act happily has given further important means of effective attack against this disease. . . . These schemes ensure early diagnosis, prompt treatment, and the removal of sources of infection, by adequately linked-up measures of domiciliary treatment, and of treatment at dispensaries, hospitals, and sanatoria.

In giving these illustrations of what medicine and the sanitary service of the country have accomplished, my survey has necessarily been incomplete. Not only is there a marvellous record for typhus and enteric fever, and for tuberculosis, but also for the diseases and accidents for which medical aid is required, and to a less extent for puerperal fever. A still more striking illustration could be found in smallpox, and even measles and whooping-cough in recent years appear to be losing some of their power under the influence of the child-welfare work which is gradually becoming systematised in many sanitary areas. . . . The saving of life in this country has not been confined to the diseases ordinarily regarded as preventable and curable. Even cancer, if only recognised and treated at an early stage, and when accessible to the surgeon, loses a portion of its terrors; and it cannot be that the concentration on investigation of this disease in nearly every civilised country will fail during the next few years to add it, like tuberculosis, to the

diseases doomed to insignificance if not actual annihilation. . . . I have not time to speak of the improvement in infant and child mortality which has been realised in recent years thanks in large measure to the active work undertaken by the officers of sanitary authorities, acting in co-operation with voluntary associations.

When criticising this speech, it must be borne in mind that the speaker was not a medical man, and that he was not appointed to his position in consequence of any special knowledge of medicine or hygiene. It is indeed a compliment to Mr. Burns to recall that he was first made a Cabinet Minister in recognition of his life-long devotion to the interests of labour. Any comments of an adverse nature, therefore, are not directed at the right hon. gentleman, whose lofty aims have always been manifest, but at the system which, in order to place at the service of the country the advice of one who has an intimate knowledge of the conditions of the working classes, can only do so by putting him in supreme charge of a Department for the administration of which he has had neither training nor experience. The Public Health work of the Local Government Board can only be carried out efficiently under the headship of one who has either a profound knowledge of Public Health, or has received a scientific training which will enable him to study and appreciate the scientific work which has been done by others. And this speech of Mr. Burns's shows that after nine years of office he was still quite out of touch with scientific medicine. From beginning to end there is no sign of any recognition that natural causes may have played a part in "saving" the large number of lives indicated. Nature is ruthlessly elbowed aside, and the whole reduction of every disease is boldly claimed as a result of sanitary progress and curative medicine. The reading of history is remarkable. The disappearance of disease is ascribed to measures which, if they were taken at all, were taken only on a very limited scale, and to the abolition of evils which are still rampant in our midst. The picture given of the steps taken to prevent typhus is directly negatived by the statement of Dr. Bruce Law, himself an officer of the Local Government Board. The "stay for months in an infirmary

or hospital of a high proportion of the total consumptive population at the most infectious and helpless periods of their illness" is considered to have played an important part in bringing about the decline in tuberculosis, yet this disease has been falling steadily for sixty years, and even to-day, in spite of the great addition made under the Insurance Act, the provision for institutional treatment is notoriously inadequate. The sanatorium treatment of tuberculosis is extolled, though investigation would have shown the speaker that it had been almost useless among the working classes in Germany, and experience is showing equally in this country that it is of little value without permanent change of environment. Measles and whooping-cough are roped in with the other diseases which are losing part of their terrors, though very little has been done in the way of providing public treatment for these maladies. Prevention of infection is regarded as the most potent weapon in the attack on disease. Finally, though the effect of urbanisation in increasing tuberculosis is mentioned, there is no indication that the speaker realised that this influence runs through the whole gamut of disease. In the two succeeding chapters we shall see that infant mortality, defects in school children, and sickness rates and mortality from nearly all diseases, are all far lower in rural than in urban environments. Whatever may be the reason for this difference, urbanisation is the overwhelming factor in the causation of preventable disease, and it links up the problem of securing a healthy people with the problems of the land. The principles and practice of preventive medicine are not to be learnt from the 'romance' of the history of typhus, but from a close study of the effects of urbanisation and of the still undiscovered ultimate causes of those effects. To omit reference to this factor, except in regard to one or two diseases, in a speech which surveys the whole field of Public Health, is to suggest that its profound and widespread influence has not been realised.

The Evils of Exaggerated Claims

The dogmatic attitude in regard to disease has many undesirable results. In a democratic country Public Health efforts can never go very far in advance of public opinion, and consequently it is exceedingly important that that opinion should be founded upon exact knowledge, or upon the best knowledge obtainable at the time. But the science of Public Health is vast and complex, and the average man has neither the time nor the training to study statistics and literature himself. He is obliged to take his conclusions ready-made from others, and he accepts, as reliable, statements made by a person in high authority, particularly if they coincide with his preconceived views. These statements go out to Borough Councils, Education Authorities, and social reformers, where they are quoted in argument, serve as a basis for local administrative action, and help to establish public opinion. Secondly, exaggeration of the 'achievements' of Public Health administration leads to a glossing over of the evils which still exist, paints a wholly inaccurate picture of the real state of the national health, and creates an undue optimism for the future. Dr. Pangloss returns from the pages of Voltaire to tell us once more that "everything is for the best in this best of all possible worlds," and with Kipling we feel that—

> By the rubbish in our wake, and the noble noise we make,
> Be sure, be sure, we're going to do some splendid things.[1]

[1] "Road Song of the *Bandar-log*."

CHAPTER III

INFANT MORTALITY AND ITS PROBLEMS

The 'natural' rate of infant mortality—The avoidable loss of infant life in the United Kingdom—Infant mortality in town and country—The possible causes of infant mortality: poverty; defective sanitation; infectious diseases; artificial feeding; industrial employment of mothers; lack of attendance at birth—Maternal ignorance—Adverse pre-natal conditions—The effect of smoke and dust—The pathological causes of infant mortality—Deaths from 'developmental conditions' Still-births—The fall in infant mortality in recent years—Infant mortality in Bradford—The need for further research.

The 'Natural' Rate of Infant Mortality

Infant mortality is measured by the number of deaths under one year of age per thousand births, still-births being excluded from both figures. Under the best circumstances a certain number of infants are bound to die in the first year of life, for the young of all species are subjected to special risks, and sometimes Nature herself does not build well enough to enable the tiny spark of life to survive. We cannot determine precisely what this 'natural' death-rate is, since we cannot study mankind under purely natural conditions, but we can ascertain the lowest rate among communities or classes of some size, and this is the essential first step in an investigation of infant mortality, for without such a minimum there is no means of measuring the avoidable loss of life occurring among other groups. We will examine for this purpose, first, the rates of infant mortality among different social classes, and, secondly, the rates in different types of areas, which is the more important investigation for practical purposes.

In his Report for 1911, the Registrar-General included a table showing the rates of infant mortality in different

classes according to the father's occupation; and in a group of these classes consisting of doctors, solicitors, army officers, clergymen, and others of the professional class, but including with them woodmen and foresters, the infant mortality rate was 42 per thousand births, which may be contrasted with the rate of 171 among general labourers, ironworkers, scavengers, and hawkers. This figure would appear to show that a death-rate of much over 40 need not occur, but the inference is not of much practical value so long as it is drawn from these facts, for it does not tell us why the rate is so much lower in the professional classes; whether, for instance, it is due directly to their wealth enabling them to obtain more food, better medical attendance, etc., or whether, as a result of that wealth, they live on the whole in a better environment. Moreover, the professional classes do not form a community, and in any circumstances we could never place the whole population under their conditions as regards wealth, though it will be shown that we may reasonably hope to do so as regards health.

The best guide for practical purposes is afforded by the lowest rates found in actual communities which are of sufficient size to eliminate variations due to accidental causes.[1] The following table shows the larger districts in the British Isles which had the lowest rates of infant mortality in 1914 :—

[1] The extent to which inferences may be built up by social reformers upon the most inadequate of statistics is well illustrated by the sweeping conclusions which have been drawn from the experience of infant life in the small French commune of Villiers le Duc. It has been claimed as a wonderful achievement that for ten years together—1892 to 1903 (we are not told about more recent years)—the infant mortality rate in the commune was zero. This absence of deaths has been ascribed to the regulations for the protection of infant life in the district, which have been widely quoted in this country and even fully described in a Milroy lecture before the Royal College of Physicians. But the fact that the total number of births during the ten years was only 54 is never mentioned, and rates per thousand are worked out on a yearly average of less than 6 births. There are no doubt many tiny English villages which can show a record as good as that of Villiers le Duc, while, as far as numbers are concerned, the experience of Crowle in Lincolnshire, in 1914, with 75 births and no deaths, is better.

Since the above was written, the writer has ascertained that during the ten years 1906 to 1915 there have been 43 births in the commune of Villiers le Duc, with 4 deaths. Thus during this period the infant mortality rate has been over 90 per thousand births. Taking the two periods together we get a rate of 46 per thousand births, which is not an unusual rate for an ordinary healthy rural district.

LOWEST RATES OF INFANT MORTALITY, 1914

Area.	Population.	Deaths under 1 year per 1000 births.
England		
Berkshire—*Rural Districts*	138,635	54
Oxfordshire ,,	101,197	55
Wiltshire ,,	162,987	57
Buckinghamshire ,,	142,538	58
Herefordshire ,,	74,116	58
Cambridgeshire ,,	73,188	59
Somersetshire ,,	232,604	61
Devonshire ,,	227,775	62
Dorsetshire ,,	105,663	62
Suffolk, West ,,	72,957	63
Sussex, East ,,	128,705	64
Huntingdonshire ,,	31,994	65
Westmoreland ,,	36,570	66
Essex ,,	265,461	67
Northamptonshire ,,	118,609	67
Surrey ,,	230,156	67
Sussex, West ,,	95,649	68
Scotland		
Sutherlandshire	18,829	46
Argyllshire	64,354	50
Ross and Cromarty	72,726	54
Kirkcudbright	36,226	69
Shetland	26,503	69
Ireland		
Roscommon	93,956	38
Cavan	91,173	40
Leitrim	63,582	42
Donegal	168,537	48
Longford	43,820	58
Sligo	79,045	58
Galway	182,224	60
Mayo	192,177	60

This table shows that large numbers of people in widely separated parts of the country and subjected to very different climatic conditions are living under conditions which do not give rise to an infant mortality rate of more than from 40 to 60 per thousand births, and it could have been much extended by including smaller

districts. It is certain that even these figures could be lowered, and we shall see later that probably any rate over 30 should be regarded as preventable, but provisionally we may take 50 deaths under one year per thousand births as the standard by which excess of infant mortality can be measured.

The Avoidable Loss of Infant Life in the United Kingdom

We are now in a position to estimate the annual loss of life in the United Kingdom which appears to be due to preventable causes. The total number of births registered in 1914 was 1,101,836, and the number of deaths under one year of age was 114,591, giving an infant death-rate of 104 per thousand births. If this rate had been 50 per thousand the number of deaths would have been 55,092. Thus we see that nearly sixty thousand lives were lost owing to presumably preventable causes. Nor is this loss the full measure of the evil, for as Dr. Newsholme has shown, a high infant mortality rate is invariably associated with a death-rate above the average at succeeding ages at least up to twenty years. If but a quarter of this number of deaths were caused by a sudden famine or pestilence which brought them prominently into notice, the most strenuous national efforts would be made to abate the evil. It is because they are scattered, and because we are so familiar with the evil, that we fail to realise the magnitude of the annual tragedy.

Infant Mortality in Town and Country

Having seen where infant mortality rates are lowest, we must now note where they are highest, and these localities are shown in the following table, together with the rates in some of the leading cities. It should be observed that the rate for a whole town is as a rule appreciably lower than those in the worst districts of the town, which in some industrial cities are as high as 200 or more per thousand births.

HIGHEST RATES OF INFANT MORTALITY, 1914

Town or District.	Population.	Deaths under 1 year per 1000 births.
England and Wales		
Ashton-under-Lyne	45,494	184
Burnley	109,131	158
Barnsley	53,008	153
Gateshead	118,684	151
Middlesborough	124,635	151
Nottingham	264,970	145
Stoke-on-Trent	239,515	145
Preston	118,118	143
Swansea	119,720	142
Liverpool	763,926	140
St. Helens	99,601	139
Wigan	90,842	139
Oldham	150,055	138
Dudley	51,668	137
Newcastle	271,523	137
South Shields	110,604	137
Sunderland	152,436	136
Sheffield	472,299	132
Manchester	731,830	129
Leeds	457,507	124
Birmingham	860,591	122
Bradford	290,642	122
Birkenhead	135,789	122
Scotland		
Dundee	176,584	135
Glasgow	1,053,926	133
Paisley	86,593	133
Aberdeen	163,044	121
Edinburgh	324,618	110
Ireland		
Dublin—Registration Area	434,678	145
Belfast	408,553	143

In London the infant mortality rate in 1914 was only 104, but the general rate is reduced by the low rates in the ring of outlying districts. In the central parts the rates range from 120 to 140 per thousand births.

The difference between urban and rural death-rates is one of the most constant and striking features in the

distribution of infant mortality, and affords a strong clue to the real causes of these deaths. We may note the effect of urbanisation on a large scale in the following table, given by the Registrar-General for Ireland, showing the rates in 'Civic Unions,' which are districts containing towns with a population of 10,000 or upwards, and the rest of Ireland.

Distribution of Infant Mortality in Ireland, 1914

Area.	Population (1911).	Deaths under 1 year per 1000 births.
Total 'Civic Unions' . .	1,629,634	120·7
Remainder of Ireland . .	2,753,974	63·9
Whole of Ireland . . .	4,383,608	87·3

The influence of rural conditions is also seen on a large scale in countries where a considerable proportion of the population are engaged in agriculture or stock-raising. For instance the infant mortality rate for the latest year available was 51 in New Zealand, 65 in Norway, 71 in Australia, 71 in Sweden, and 78[1] in France.

An analysis of the rates in France in 1912 is given in the following table :—

Area.	Population.	Deaths under 1 year per 1000 births.
Towns of 5000 inhabitants and above	15,228,000	111·4
Remainder of France . .	24,422,000	57·8
All France	39,650,000	78·0

It should be noted that 1912 was a year of exceptionally low infant mortality in nearly all European countries.

The statistics for England and Wales as a whole do not show such striking differences as those presented by Ireland and France, the rates for 1914 having been 121

[1] This figure is not strictly comparable with British rates, since in France deaths occurring before registration, *i.e.* before the third day, are regarded as still-births.

in the aggregate of County Boroughs, 99 in other Urban Districts, and 85 in Rural Districts, but this is due partly to the fact that the distinction between 'urban' and 'rural' for registration and statistical purposes does not always conform to the differences in the meanings of these words as commonly understood. Since we shall have occasion in this and the succeeding chapter to quote frequently urban and rural statistics, it is important to pay some attention to this point. In the figures previously given for Ireland and for France, definite lines of division were taken based upon population. But in England and Wales the Registrar-General, when classifying deaths according to 'Municipal Boroughs,' 'Urban Districts,' and 'Rural Districts,' is unable to proceed on this basis, since the distinction between these areas is often a matter of history or convenience, and may have little relation to the population or real character of the district. In consequence we find included in urban districts a large number of Municipal Boroughs with populations of less than 5000,[1] and a still greater number of Urban Districts with populations ranging from 5000 to 1000 or even less, many of which are really rural villages. On the other hand we find included in Rural Districts large villages which have gradually grown up and perhaps coalesced with adjacent villages, until they really form a town of some size, though for registration purposes each still forms a Rural District. This development has been particularly marked in the northern counties of England, where great mining areas such as those of Chester le Street in Durham, with a population of 67,667 and an infant mortality rate of 140, and Easington in the same county, with a population of 64,935 and an infant mortality rate of 159, contain large densely crowded villages with very little of a really rural character about them. A picture of the conditions in one of the so-called rural areas is given on p. 91. For these reasons the statistical difference between 'urban' and 'rural,' when applied to the whole of England and Wales, does not correspond entirely to real

[1] *E.g.* Wallingford, Buckingham, Wokingham, Fowey, Helston, Penryn, Okehampton, Lyme Regis, Chipping Norton, Bishop's Castle, Lymington, Romsey, Southwold, Arundel, Malmesbury, Beaumaris.

differences, and the general effect is to lower the urban death-rate and raise the rural death-rate. In the succeeding pages, therefore, most of the comparisons will be made between the County Boroughs of the north of England which are the great centres of industrialism, and the Rural Districts of the south which do actually conform to their description. The objection may be made that this comparison does not eliminate climatic differences, but we shall see later that as regards infant mortality, climatic differences appear to exert little effect, the rates and causes of deaths being essentially the same whether we take the south of England or the north of Scotland, and there is no reason to doubt that this is equally true of deaths at later ages. It is however more convenient to deal with the statistics of the south of England than with those of rural Scotland or Ireland since they are more complete.[1]

The rates of infant mortality in the areas defined are—

County Boroughs of the North	130
Rural Districts of the South	66

The preceding tables have shown the extreme difference between purely rural and strongly urban districts. It is important to notice however that low rates of infant mortality may be found in towns, even of some size, in which there is little overcrowding or industrialism, with consequent purity of air and freedom from smoke—"country" towns as many of them would be called—though even in these the rates are generally higher than in the purely rural districts. The following are examples of such towns with their rates of infant mortality in 1914:—

Bath	59	Tunbridge Wells	79
Bournemouth	72	St. Albans	52
Canterbury	60	Dover	76
Eastbourne	61	Folkestone	62
Hastings	64	Worthing	60
Oxford	72	Colchester	82
Southend	69	Walthamstow	77
Bedford	58	Leyton	79
Poole	77	Hornsey	58
Rochester	80	East Ham	76

[1] In future references 'North' includes Cheshire, Lancashire, Yorkshire, Durham, Northumberland, Cumberland, and Westmoreland; 'South' includes Surrey, Kent, Sussex, Southampton, Isle of Wight, Berkshire, Wiltshire, Dorsetshire, Devon, Cornwall, and Somerset.

The proportion of seaside towns in this list is noteworthy, and is possibly due to the fact that they are usually built in long strips parallel with the sea, and are thus open to absolutely pure air along their greatest length.

The distribution of infant mortality is then very far from uniform, the highest rates occurring in industrial towns, the centres of great cities, and mining districts; while low rates are practically universal in rural districts, and are met with in many towns of a rural character. This distribution emphasises the need of local efforts to reduce the evil rather than of measures of general application which take no cognisance of local differences.

We shall see in the next chapter that the difference between urban and rural rates of sickness and mortality is not confined to infants, but extends to defects in children, and to disease and death in all classes at all ages. This is one of the most striking facts brought out by a study of vital statistics; but although recognised in a general way, it is doubtful whether the full extent of the difference has been realised, and it is certain that nothing like sufficient attention has been devoted to ascertaining its causes. If we are to reduce infant mortality in this country, and improve Public Health in many other directions, recognition of the overwhelming effects of urbanisation, and investigation of its exact cause, must form the basis of all effective action.

The Possible Causes of Infant Mortality

It might have been expected that with so important a clue furnished by the distribution of infant deaths, some unanimity would have existed as to the cause or causes of these deaths. But this is not the case; a great variety of causes are brought forward, such as defective sanitation, poverty, overcrowding, bad housing, insufficient nutrition of the mother, want of breast-feeding, maternal ignorance, and paternal vice, and there is little attempt to estimate the relative effect of each of these factors. In general it will be found that each investigator tends to regard as the most potent influence that evil which is most often

or most strongly brought under his notice. The gynæcologist, while admitting other causes, dwells most urgently upon pre-natal influences, such as syphilis or malnutrition, and upon lack of attention at birth; the educationalist upon ignorance; the temperance reformer upon alcoholism; and the worker among women upon the employment of women in factories. As an illustration of the extent to which views differ regarding the effects of different influences, we may note the utterances of some distinguished authorities. Dr. Newsholme, of the Local Government Board, though he by no means excludes other factors, says in the general summary of his report: "Infant mortality is the most sensitive index we possess of social welfare and of sanitary administration especially under urban conditions."[1] Sir George Newman, on the other hand, says: "It is now a well-established truism to say that the most "injurious influences affecting the physical condition of "young children arise from the habits, customs, and "practices of the people themselves rather than from "external surroundings or conditions. The environment "of the infant is its mother. Its health and physical fitness "are dependent primarily upon her health, her capacity "in domesticity, and her knowledge of infant care and "management."[2] And again: "*The principal operating "influence is the ignorance of the mother and the remedy is "the education of the mother.*"[3] Dr. Mary Scharlieb, a member of the Royal Commission on Venereal Diseases, says: "The responsibility for the excessive amount of "infant mortality must be distributed, as we have seen, "among many causes, but probably the most frequent "cause, and certainly the one most within our power both "to avoid and cure, is syphilis."[4]

There is no doubt that every one of the causes mentioned operates to some extent; but it is not sufficient merely to know this, for some of them probably exert only a very minor influence, while others are of great importance. It is clear that we must have an idea of the relative effects of different causes of infant mortality in order to apply

[1] "Infant and Child Mortality," *Supplement to Thirty-ninth Annual Report of the Local Government Board*, 1910. [2] *Annual Report* for 1914.
[3] *Annual Report* for 1913. Italics in original. [4] *Nineteenth Century*, May 1916.

sound remedies, for if we do not possess this, we may be led to devote much attention to a factor which is only slightly responsible, while neglecting those which produce serious effect; and it will be shown that this is actually occurring. The problem of determining and measuring the causes of infant mortality is exceedingly complex, and in spite of the great amount of work which has been done, still demands much further investigation, particularly by persons not committed to definite views or holding official positions, for these are apt in consequence to seek only evidence in support of their views. Nevertheless, the lowness of the infant mortality rates in rural districts almost without exception should afford a valuable clue as to what is the precise cause of the excessive rates in urban environments, for it must be remembered that many of the factors generally believed to be prejudicial to infant life are as prevalent in country districts and villages as in towns, and we have therefore considerable justification for eliminating those factors which are common to the two environments. We will examine *seriatim* the causes most frequently held responsible for high infant mortality.

Poverty is often looked upon as one of the greatest causes of infant deaths. Yet *per se* it does not appear to be so. The wages paid in agricultural districts are notoriously the lowest paid in the community, yet the infant mortality rate in rural Wiltshire averages only about 60, while in Kensington the average is over 100. The earnings of the Connaught peasant or the Highland crofter do not approach those of the miners of Durham or Glamorganshire, yet the loss of infant life among them is only one-third of that in mining areas. The influence of poverty is felt most directly in housing and food-supply, yet it is impossible to say that in these respects rural districts are better off than towns. It is well known that housing in many rural districts is deplorable. A cottage may look picturesque, but its thatched roof and creepers may hide defective walls and floors, unsound drainage, low ceilings, and ill-ventilated rooms, fully as bad as those in the worst quarters of cities. The rooms may be overcrowded, and there may be no adequate conveniences for cooking

or maintaining cleanliness.[1] And not only may the cottages be defective, but in many villages there are patches of overcrowding which present the worst features of town slums. It is indeed well recognised that the difficulty of obtaining sufficient housing accommodation for labourers has been one of the great obstacles to agricultural development in recent years. When we examine food-supply we find no reason to suppose that the agricultural worker is better off in this respect than the town dweller. We know as a matter of fact that the poor in rural districts are often insufficiently fed, and meat for the family may be an exceptional luxury.

Defective Sanitation.—The word 'sanitation' is here used not in its widest sense as meaning all conditions making for healthy living, but as applying to the services for the supply of water and the removal of household waste material, etc. As regards water-supply the services in large towns under the control of big companies or municipalities are undoubtedly better than those in many villages which are dependent upon wells and surface sources for their water; and the same difference applies to household sanitary conveniences. In various mining and industrial towns in the north of England it is true that the ashpit system and insufficiently frequent removal of dust and refuse contribute to infant mortality, particularly from epidemic diarrhœa, but we cannot regard the difference in these respects as sufficiently great or widespread to account for the great difference between urban and rural infant mortality. In many large towns, especially in the south of England and the Midlands, the sanitary services are highly efficient and in accord with the most modern

[1] Mrs. Bruce Glasier has given us the following picture of such conditions:—

"I have myself lived among such women for over twelve years—for six of them in a 5s. a week cottage in Derbyshire, and know by first-hand experience as well as by intimate friendship what the work of such a home involves.

"There are no 'modern appliances,' no hot water at the sink, too often hardly a decent oven, or a boiler for washing clothes; lighting is by candle or paraffin lamp, and mud will be mud—inches deep—and be brought into the house at all hours of the day in wet weather as the children run to and fro. On a small wage, in an overcrowded kitchen, to bake the bread and wash the clothes, to prepare meals thriftily, to keep the children clean and mended and warmly provided for—and not to let that home degenerate into an unkempt hovel or herself and her children sink into a condition of grubby animalism, is to be a skilled and heroic toiler, sixteen hours a day for seven days a week."—*Daily News*, February 21, 1916.

ideas, yet some of these towns show an infant mortality rate of over one hundred. In London, municipal sanitation has attained a high level of excellence, yet wide areas in the central parts exhibit an infant death-rate ranging from 100 to 140 per thousand births. On the other hand, sanitation in many rural districts is still very primitive. In the west of Ireland many villages are deplorably insanitary and the habits of the people sometimes most unhygienic, yet these districts exhibit the lowest rates of infant mortality to be found in the British Isles.

Infectious Diseases.—Another factor which might be suggested, is the greater probability in towns of infection by diseases common among children, such as measles, whooping-cough, and diphtheria. To determine this point with absolute certainty we require to know the number of *cases* of each disease in urban and rural environments respectively, and not merely the deaths ; but since measles and whooping-cough are not notifiable diseases, this information is unavailable. General experience however shows that both diseases are widespread in every type of locality ; and wherever there is a school, opportunities for transmission exist. Scarlet fever and diphtheria are notifiable, and we find that the incidence of these diseases does not differ largely in town and country ; notifications of scarlet fever, in 1914, having been 4·74 per thousand of the population in the aggregate of County Boroughs of England, and 3·45 in the aggregate of Rural Districts ; and notifications of diphtheria having been 1·54 and 1·32 respectively. Arguing from analogy, we may infer that measles and whooping-cough do not differ widely in incidence in urban and rural districts ; though, as we shall see later, their mortality rates are much higher in industrial towns than in rural areas.

Breast-feeding is undoubtedly an important factor in maintaining health in infants, but there is no reason to suppose that it is not as widely adopted in towns as in the country. Dr. Newsholme has estimated that over 80 per cent of wage-earning mothers suckle their children. Dr. Manby of the Local Government Board, who specially investigated this question in Widnes, where infant mor-

tality is very high, found that breast-feeding among the working classes was "almost universal." It may be noted that the poorer the home the more likely is the infant to be breast-fed, since it is the most economical course, and also to some extent because of the widespread belief among the uneducated that so long as a mother suckles her child she will not again become pregnant. It is certain that the proportion of mothers of the wealthier classes who suckle their infants does not reach 80 per cent.[1]

Industrial Employment of Women.—This is a factor which at first sight might appear to possess much importance, since it might conceivably have an injurious effect upon the infant while the mother is pregnant, and it is known that after birth it tends to hinder breast-feeding. But special researches here also have failed to establish a close and constant connection between women's labour and high infant mortality. In Wigan, for example, where only 12 per cent of the total married women and widows are engaged in non-domestic work, the infant mortality rate in 1913 was 180, whereas in the textile town of Rochdale with a percentage of 28 so employed, the rate was only 106. The question is complicated by the fact that among the poorest classes harm caused by employment may be more than counterbalanced by the additional food and home comforts which the mother is able to purchase with her earnings; but, as Dr. Newsholme has pointed out, the industrial employment of married women cannot be looked upon

[1] While it is important on many grounds to encourage breast-feeding, there is perhaps some danger of exaggerating the harm done by artificial feeding. Statistics certainly show that the death-rate among bottle-fed babies is much higher than among naturally-fed infants, particularly from diarrhœa, but caution must be observed in drawing conclusions from these, for it must be remembered that the class of artificially-fed infants includes some who ceased to be breast-fed because they were not thriving on that system, and their deaths may be due to some cause acting before the artificial feeding was commenced. Experience among the wealthier classes shows that if other conditions are satisfactory it is quite possible to rear a healthy child on cows' milk. On the other hand, the investigations of Dr. Lawson Dick, described on p. 118, show that rickets may be very prevalent among children who have been breast-fed. The injurious effect of bottle-feeding would appear to be limited to the first year of life. Dr. R. H. Norman, from a study of 313 children between the ages of 3 and 8 years in the infant schools of St. Pancras and Holborn, found that a larger percentage of children, who had been breast-fed during the first year, fell below the average both in height and weight than bottle-fed children. He points out, however, that we cannot eliminate other factors as being responsible for the difference. (*Annual Report of London County Council on Public Health*, 1913.)

as the chief cause of infant mortality. Dr. Greenwood, formerly M.O.H. for Blackburn, found very little difference in the infant mortality rates among mothers industrially employed and those not so occupied, and he says: "As a result of this investigation I came to the conclusion that no case had been made out for the further restrictive legislation in the prohibition of employment of women in the cotton mills in Blackburn." [1] Dr. Jessie Duncan at Birmingham found that there was scarcely any difference in the weights of children whose mothers were industrially employed and those whose mothers were not. We may see that hard work is not necessarily incompatible with low infant mortality, for women often undertake heavy labour about farms, and even toil in the fields, in many parts of France and the remoter districts of Scotland and Ireland. The unprecedented demand for female labour during the war does not seem so far to have caused any rise in the infant mortality rate.

Skilled Attendance in Child-bed.—The value of attendance by doctor or midwife will be examined in detail in the chapter on Medical Treatment among the Working Classes. For the present purpose it is sufficient to point out that the facilities for such attendance are obviously greater in towns than in country districts, in many of which the supply of midwives is inadequate and the services of a neighbour may be the only help available. In St. Helens, Cardiff, Bootle, Walsall, and Stoke-on-Trent, from 80 to 100 per cent of all births are attended by midwives, yet infant mortality in these towns is very high; [2] on the other hand there is no Midwives Act in Ireland, yet the infant mortality rate in that country is very low. We shall see later that the Midwives Act, which came into force in 1905 and has been steadily increasing the proportion of trained midwives and improving the midwifery service generally, has not been accompanied by any reduction in infant mortality during the first month of life.

Ancillary services, such as infant clinics and consultation centres, are also few and far between in rural districts.

[1] *Jour. Roy. San. Inst.*, vol. xxxii., 1911.

[2] "Report on Maternal Mortality in Connection with Child-bearing," *Supplement to Forty-fourth Annual Report of the Local Government Board*, 1914–15.

Maternal Ignorance.—Ignorance of the mother as to the proper way in which to feed and care for her child is at present widely regarded as one of the chief causes of infant mortality. Sir George Newman's views, already quoted, meet with much support, and measures for the dispelling of maternal ignorance form the basis of the modern campaign which has led to the Notification of Births Acts, the establishment of schools for mothers and classes in 'mothercraft' for girls, and the visiting and advising of mothers on the care of infants—looked upon as a very important part of a health visitor's duties. For the present purpose it would be sufficient to point out that facilities for such instruction are more numerous in towns than in the country, and if they have an appreciable influence, we might expect mortality to be lower in urban than rural districts. In view however of the importance now attached to maternal ignorance as a cause of infant deaths, it is desirable to examine the subject in greater detail.

That some ignorance exists among mothers is unquestionable, but many facts show that both its extent and effects have been grossly exaggerated. If maternal ignorance is the main cause of a high infant mortality rate, we must necessarily conclude that where the rate is low mothers are well instructed. But there is no reason to believe that rural mothers are so much better informed in the care of infants than their town sisters. We cannot assume that the Connaught peasantry—many of whom can neither read nor write—are so well instructed in the care of infants that as a result infant mortality among them, in spite of poverty and hard conditions, is one-half that among the mothers of Kensington or Westminster, and one-third of that in Bradford where so much has been done in providing instruction for mothers. If it be objected that these areas are too widely separated and diverse for fair comparison, then we can examine rates among mothers drawn from the same class and brought up and educated in essentially the same way, and we must believe that mothers living in the peripheral parts of London, such as Wandsworth, Stoke Newington, East Ham, and Ilford, know far more about the care of infants

than those in the central parts, such as Bermondsey, Finsbury, and Shoreditch. If instead of areas we examine social classes, we find that the wives of woodmen and foresters must be credited with as great a knowledge of the conditions governing infant welfare as that possessed by the professional groups ; and we must believe that the wives of agricultural labourers and shepherds excel in this respect all other classes of manual workers.

There is as much lack of the scientific spirit in drawing deductions relating to infant mortality as is displayed in regard to infectious diseases. If a school for mothers or an infant clinic is opened in a district, and infant mortality declines, the relation of cause and effect is at once claimed. A well-known and earnest social reformer, describing the instruction given to mothers at an infant clinic, writes : " Special stress is laid on the hygiene of the home, good and sufficient food, sufficient and suitable clothing, cleanliness, and a proper amount of sleep. The children are examined and weighed weekly, so that some idea can be gained as to the beneficial results of the advice given." It is evident that in the mind of this sincere philanthropist all improvement must be ascribed to the advice given ; but it is impossible to believe that those who write in this strain really know the conditions among large masses of the poor and their utter inability to follow the courses indicated. Dr. Wanklyn of the London County Council has vigorously described the difficulties against which the poor have to struggle, and the following is an account he gives of a London tenement which is typical of many such habitations :—[1]

The tenement comprises the two top rooms of a small house, without any offices, conveniences, or adjuncts of any kind, except a wall cupboard. The front room measures 14 ft. by 11 ft. by 6 ft. 6 ins., and the back room 9 ft. by 7 ft. by 6 ft. 6 ins. They are in fair repair, but some wood-work running round the room is said to be infested with bugs. . . . There is no place for storing food or crockery or knives and forks and the rest, except one wall cupboard in the front room. There is no scullery, no sink, or even water for washing up, no draining board or any place on which to handle clean things ; no water-closet nearer than at the foot of thirty-six stairs ; the w.-c. is in the back-yard and is used in common by thirteen

[1] " Working-class Home Conditions in London," *Trans. Roy. Soc. of Med.*, 1913.

people in the house, no one person is responsible for its cleanliness. There is no slop sink or a sink of any kind nearer than the w.-c. There is a wash-house; it is in the basement below the level of the back-yard; it is used on separate days by the various inmates of the house. The yard may serve as a drying-ground, but it is a long way off from the attic. There is no coal or wood store except the wall cupboard in the front room. There is no cold water tap nearer than in the back-yard or the basement. It was stated that as soon as the tenement was occupied water was to be laid on to a tap placed half-way between the first and second floors, with a small sink placed underneath it. There is a small cooking range but no hot water supply. Shortly afterwards there came to live in this tenement a man and wife and four children, the six persons permitted by the by-laws to occupy its cubic space.

Dr. Salter has stated recently that there are only 125 houses or tenements in Bermondsey with a bath-room, and of these 96 are in public-houses. These conditions are widespread, and they effectually prevent any semblance of decent living. Cleanliness cannot be maintained; privacy is impossible; children cannot sleep properly when there are three or more in a bed; and their growth is stunted when their only fresh air is that of the slums, and their only playground the streets. When we add to these conditions the task of ekeing out a weekly wage to provide food for a family, it becomes outrageous to ascribe dirt and neglect to maternal ignorance under such circumstances.

Mrs. Pember Reeves, who has very ably investigated housekeeping conditions among the poor, has given us a number of family budgets, of which the following is a typical one for a week:—[1]

Mr. K., labourer. Wages 24s. Allows wife 22s. 6d. Six children.

	s.	*d.*
Rent	8	6
Burial insurance	1	0
Oil and candles	0	8
Coal	1	6
Clothing club	0	6
Soap, soda	0	5
Blacking and blacklead	0	1½
	12	8½

Left for food . . 9s. 9½d.

A note against the budget says: "Sole old pram for 3s., it was too litle. Bourt boots for Siddy for 2s. 11½d. Made a apeny."

[1] *Round about a Pound a Week*, 1913.

Mrs. Pember Reeves says: "That the diet of the poorer London children is insufficient, unscientific, and utterly unsatisfactory is horribly true. But that the real cause of this state of things is the ignorance and indifference of their mothers is untrue. What person or body of people, however educated and expert, could maintain a working man in physical efficiency and rear healthy children on the amount of money which is all these mothers have to deal with? It would be an impossible problem if set to trained and expert people. How much more an impossible problem when set to the saddened, weakened, overburdened wives of London labourers?"

Here is another picture of life among the poor given by a special constable:[1] "On Thursday morning I was on duty from two to six o'clock—a pouring wet morning—and at 3 A.M. I counted no less than fourteen children seeking the warmth of the brazier in Cheval Place. There were three girls, aged eleven, twelve, and fourteen respectively, and eleven boys, whose ages varied from nine to fourteen. They lay huddled together on the wet flags round the brazier in the rain—most of them thus falling asleep—a truly pitiable sight! One wonders what chance these children can have of proper physical development." These children had taken up their places in order to be the first to buy the previous day's bread when the bakeries opened at 6 A.M. Further letters showed that this was not an exceptional occurrence, but that the practice had been established for a considerable time in widely separated districts. The children on inquiry were found to come from respectable parents, to whom the loss of the bread would have been a severe privation, and some of them had walked a long way to reach the bakeries. Such are the real conditions among the poor in this great country; and under these circumstances the glib statements of some social reformers regarding maternal ignorance appear to the writer intolerable.

[1] *Morning Post*, January 13, 1915.

The Influence of Adverse Pre-Natal Conditions

This also is regarded as a powerful cause of infant mortality, of equal or even greater effect than maternal ignorance. The view held is that either disease or malnutrition or poor physical development in the mother affects the infant during the period of gestation, and causes it to be either still-born or born in a sickly condition which leads to death soon after birth.

Of definite chronic diseases as distinguished from general ill-health, syphilis is the only one which has a distinct effect upon the infant and is sufficiently widespread to influence the statistics, for we may neglect the relatively small number of infant deaths due to maternal heart-disease, diabetes, etc. Syphilis in either parent is apt to affect the offspring, nevertheless we cannot regard it as a large cause of infant mortality. The total recorded infant mortality from this disease in England and Wales in 1914 was 1·5 per thousand births, the total mortality from all causes being 104·6. It is known that the statistics on this point are unreliable, since deaths from syphilis are sometimes certified under some other cause; yet if we double or even treble the recorded figure, syphilis still only becomes responsible for a small proportion of the total loss of life. Dr. Fildes,[1] in an examination of 677 London infants by means of the Wassermann test, found only four syphilitic, of whom one died and two showed no symptoms. The most frequent effect of syphilis is to cause still-birth, but we shall see later that even in this direction there are reasons for thinking that the effect of the disease has been exaggerated.

The chief maternal conditions, then, which might be expected to have an injurious effect upon the offspring are poor development and malnutrition, and we must examine the effect of these *in the degrees commonly met with* among the working classes, and not those presented by extreme cases. When this is done we shall find that malnutrition in the mother appears to exert very little influence

[1] "Report to Local Government Board upon the Prevalence of Congenital Syphilis among the Newly-born of the East End of London," *Reports on Public Health and Medical Subjects* (New Series, No. 105).

upon the infant. It is well to be quite clear what is meant by this statement. The writer does not suggest that a mother who is literally half-starved or seriously malformed will give birth to children as sound as those of a well-nourished and well-developed woman; but that on the average the range of variation in these maternal conditions from class to class and place to place is not sufficiently great to produce an appreciable effect upon the offspring. Working-class mothers in towns are certainly on the average much less healthy and vigorous than those in rural districts or those of the wealthier classes, but the proportion of town mothers who exhibit extreme degrees of defectiveness is after all but small. It would appear that Nature provides for the offspring first, and though it is difficult to believe that the infants of anæmic and poorly-nourished mothers would not be affected, it seems that unless the condition is extreme the infants do not suffer. "Few things," says Sir George Newman, "are more remarkable in the life of the very poor than the apparent "vigour and equipment of their offspring *at the time of birth*. . . . This does not indicate that the health or "environment of the mothers during pregnancy is of no "account. For such is not the case. The physique of "the mother does unquestionably exert an effect on "her offspring, but the tendency of nature *is on behalf of her infant*. It is well indeed that it is so, and it is this "that brings perhaps 70-80 per cent of all new-born "infants up to a mean physical standard in spite of ill "environment or the poverty of the mother's physique." [1]

To test this point we must compare the infant death-rates of favourably and unfavourably situated classes during the first few weeks of life before the influence of the external environment begins to tell. If defective pre-natal conditions are the main cause of infant mortality, we should expect the difference in these classes to be greatest in the early weeks of life, and to decrease as the child gets older and farther from the original injurious influences. On the other hand, if the post-natal environment is responsible, we should expect the difference to increase the longer

[1] *Infant Mortality*, 1906.

the children are exposed to it. And this is exactly what happens. The point is so important that it must be examined in some detail.

The Chief Medical Officer to the London County Council has grouped the Metropolitan Boroughs in order of 'social condition,' the standard adopted being the percentage of children in each Borough who were scheduled for education in the Council schools. Group I., which is the best group, contains Boroughs in which less than 82 per cent of the children were so scheduled; in Group V., which is the worst, 97 per cent and over of the children were scheduled. The following table shows the deaths per thousand births in each group at various ages for the year 1913 :—

Infant Mortality in Relation to 'Social Condition,' 1913

Age-period.	Group of Boroughs in order of 'Social Condition.'				
	I.	II.	III.	IV.	V.
Under 1 week	18·3	22·0	21·3	21·7	19·7
2nd week	5·2	4·6	5·4	4·9	5·0
3rd ,,	3·6	4·2	4·0	4·3	5·5
4th ,,	1·6	3·2	3·8	3·8	3·4
Under 1 month	28·7	34·0	34·5	34·7	33·6
0-3 months	45·1	51·7	54·5	55·1	56·9
4-6 ,,	13·3	18·2	20·0	19·3	27·0
7-9 ,,	7·6	13·6	14·6	16·0	22·0
10-12 ,,	9·0	13·2	13·6	13·6	19·2
0-12 months	75·0	96·7	102·7	104·0	125·1

Up to two weeks there is practically no difference in the death-rate in any of the groups. After the first fortnight the rate begins to rise in each group in comparison with I., and exhibits the greatest rise in V. At age 4-6 months the rate in V. is twice as great as that in I., and at 7-9 months it is nearly three times as great. It may be of interest to give the figures for the Boroughs which had the lowest and highest yearly rates :—

INFANT MORTALITY IN BOROUGHS WITH LOWEST AND HIGHEST RATES

Age-period.	Hampstead.	Lewisham.	Woolwich.	Bermondsey.	Finsbury.	Shoreditch.
Under 1 week	21·1	17·0	20·0	19·8	21·2	21·6
2nd week	4·5	5·1	4·2	3·6	5·5	6·5
3rd ,,	3·0	4·0	3·8	4·9	8·2	6·8
4th ,,	1·5	1·4	3·8	2·5	4·3	2·3
Under 1 month	30·1	27·5	31·8	30·8	39·2	37·2
0-3 months	44·4	44·3	48·0	55·4	65·2	68·8
4-6 ,,	13·6	13·3	10·0	29·0	29·8	29·9
7-9 ,,	6·8	7·1	12·8	21·3	21·6	28·2
10-12 ,,	3·8	10·8	8·3	23·9	20·0	23·9
0-12 months	68·6	76·5	79·1	129·6	136·6	150·8

It will be noticed that while the rates in Hampstead and Shoreditch are practically identical during the first week, and Shoreditch only shows an excess of about 25 per cent in the first month, by the time the period 7-9 months is reached, the rate in Shoreditch is more than four times as high as that in Hampstead, and at 10-12 months it is more than six times as high.

Dr. Forbes, the Medical Officer of Health for Brighton, has shown that in his district the death-rate under one week is 20·4 in the poorest class, and 20·5 in the well-to-do class, whereas the rates for the whole year are 144 and 67 respectively. He remarks that if his statistics are correct, " then the better feeding, the better housing, the freeing of the mother from manual work and anxiety before the birth of the child have no effect upon the health of the child at birth." [1]

Dr. Stevenson, of the Registrar-General's Office, included in his report for 1911 a special investigation into the relations between infant mortality and the father's occupation. He did not separate the rates in the first week, but the following are his results at different months :—

[1] *Jour. Roy. San. Inst.*, December 1915.

Infant Mortality in Social Classes at Different Months of 1st Year, 1911

Social Class.	Under 1 Month.	2-3 Months.	4-6 Months.	7-9 Months.	10-12 Months.	Total under 1 Year.
Middle and upper class	30·2	14·9	13·0	9·9	8·4	76·4
Agricultural labourers	36·8	17·9	18·2	13·0	11·0	96·9
Shopkeepers, dealers, etc.	36·5	20·6	20·3	16·3	12·7	106·4
Skilled workmen .	36·8	21·2	22·1	17·8	14·8	112·7
Intermediate workmen	38·6	22·7	23·8	19·7	16·7	121·5
Textile workers . .	44·4	27·9	32·3	23·6	19·9	148·1
Unskilled workmen .	42·5	28·6	31·4	26·2	23·8	152·5
Miners	46·5	28·3	33·7	27·5	24·1	160·1

These statistics show that the excess of mortality in the class consisting mainly of unskilled labourers over that of the middle and upper classes was 41 per cent in the first month, 92 per cent at 2-3 months, 165 at 7-9 months, and 183 at 10-12 months. We shall see later that even in the first month the excess among miners, textile workers, and unskilled labourers must be attributed to conditions in the external environment and not to pre-natal influences. Commenting on the table, Dr. Stevenson says : " These astonishing figures not only show what can be done, but clearly point to the plan of campaign, viz. an attack upon the causes of mortality in the later months of the first year of life."

We have now compared death-rates at periods during the first year in different types of urban areas and in different social classes, and we will complete the investigation by comparing the rates in urban and rural districts, this being the most important comparison of all in view of the great difference in the yearly rates between these two classes of areas. Unfortunately no recent statistics are available showing the rates in the first week, nor can we set out the figures for the extremes of conditions represented by the County Boroughs of the North and the Rural Districts of the South. The Registrar-General however gives the rates for the County Boroughs and Rural Districts for

England and Wales as a whole, and the following are his figures for the year 1914 :—

Infant Mortality in County Boroughs and Rural Districts

Area.	Under 1 Month.	2-3 Months.	4-6 Months.	7-9 Months.	10-12 Months.	Under 1 Year.
County Boroughs	41·4	22·8	22·2	18·2	16·2	120·8
Rural Districts .	36·7	14·8	13·4	11·2	9·3	85·4

Here again we notice that the difference between urban and rural rates is small during the first month, but increases steadily as age progresses. Dr. Stevenson says of these figures : " The chances of survival seem to differ but little at birth in town and in the country, but the noxious influences of the former soon come into play, and make themselves felt to an increasing extent as the first year of life progresses, and to a still greater extent in the second and third years when the urban excess generally approaches 100 per cent, thereafter gradually declining."

Rates of mortality do not afford an absolutely complete index of healthiness, for in addition we ought to compare physical development and the incidence of non-lethal defects in different classes. Information on these points during the first month of life is scanty, but we may note Dr. Kerr-Love's interesting and important observation that the children of the poorest mothers in Glasgow weigh on an average 7·1 lb. at birth, the average weight of a healthy child being 7 lb.[1]

When we see therefore that the infant death-rate in the first week of life is almost constant under all circumstances, and that the range of variation in the first month is small, but that thereafter differences between favourably and unfavourably situated classes become progressively greater as the child gets older, we are led irresistibly to the conclusion that these differences are almost entirely due to the action of the post-natal environment and not to the influence of pre-natal conditions. Unexpected though the conclusion may have appeared at first, it is

[1] Evidence given before the Royal Commission on Venereal Diseases.

impossible to interpret the figures otherwise than by the view that on the average the children of all classes under all circumstances are born equally healthy. This is not to deny that in each class and in each type of environment a certain number of children die from the pre-natal effects of some deficiency or defect in the maternal organisation, but we shall see later that this number is remarkably constant and appears to have no relation to the external environment. The town mother, though on the average less well-nourished than her country sister, seems yet to have a margin to spare, and Nature takes care that her infant does not suffer. If the view that the infants of all classes are born equally healthy is correct, it follows that as far as physical development is concerned there is little in the cry that we are breeding mainly from the 'worst stocks.'

The Effect of a Smoke- and Dust-polluted Atmosphere

We have now examined, with one exception, the main factors which might be held to account for a high rate of infant mortality, and we find that differences neither in poverty, bad housing, insufficient feeding, defective sanitation, disease, industrial occupation of women, nor malnutrition of mothers can be regarded as adequate to explain the excessive and widespread difference between urban and rural rates of infant mortality. The factor which remains to be examined is that of smoke and dust in the atmosphere. Dirtiness of the air appears to be the one constant accompaniment of a high infant mortality : purity of the atmosphere is the one great advantage which the agricultural labourer of Wiltshire, the Connaught peasant, and the poverty-stricken crofter of the Highlands enjoy over the resident in the town. In the opinion of the writer, a smoky and dusty atmosphere as a cause of infant mortality far transcends all other influences.

We have noticed that the highest rates of infant mortality always occur in manufacturing towns, and over these there hangs throughout the year a pall of smoke which has been estimated to cut off 20 per cent of bright

sunshine, and as much as 40 per cent of the total light. The soot emitted from the chimneys is not carried off by the wind, but falls rapidly in the immediate neighbourhood. This is established by investigations such as that of A. G. Ruston,[1] who has shown that the amount of solid material deposited in the industrial area of Leeds is 1900 lb. per acre per annum, while three miles north-east of the centre of the town it is only 90 lb., and five miles from the centre it is reduced to 62 lb. per acre. In Greater London the annual fall is about 440 tons per square mile ; in Glasgow it is 1330 tons, and in Coatbridge, the centre of the Scottish iron industry, it reaches the amazing total of 1939 tons. In such towns, if the sanitary services for the removal of refuse are not of the highest efficiency, the atmosphere is further polluted by the dust blown up from the dirty streets, back-yards, and ash-pits, and contributes particularly to epidemics of enteritis among infants. On the other hand, the purity of the atmosphere explains the relatively low rates of infant mortality exhibited by scattered, open, residential, or seaside towns which have few factories. In correlation with these facts we shall note the excessive mortality from respiratory diseases among infants living in industrial towns.

The factories however are not alone to blame. In large crowded areas the smoke poured out from the thousands of domestic chimneys is equally pernicious, and it is a remarkable fact that in all large cities the infant mortality rate tends to increase steadily as we go from the periphery towards the central districts which never receive a wind that has not passed over a smoke-laden area. This distribution is well illustrated by London, but in order to study it we must have before us a map of ' greater ' London, since we are not concerned with the arbitrary boundary of the London County Council area, but with the whole great patch of streets and houses. There is an outlying ring all round London in which the average infant mortality rate was 74 in 1914, and was as low as 48 in Wanstead (66 in 1913, and 47 in 1912), 58 in Hornsey, and 61 in Ilford. Inside this is an inner ring

[1] *Jour. Roy. San. Inst.*, 1912.

where the average rate in 1914 was 97 ; and in the centre there is an area consisting of Finsbury, Shoreditch, Bethnal Green, City of London, Southwark, Bermondsey, Stepney, and Poplar, in which the average was 124, and the highest figure 142 in Shoreditch.[1]

These differences may be due in part to the outlying and more salubrious districts containing a larger proportion of the wealthier classes, but it is clear that this cannot be a preponderating influence from the fact that the rates in such places as Ilford, East Ham, Walthamstow, Leyton, and Wanstead are as low or lower than that in Hampstead, and lower than those in Kensington, Paddington, and Westminster. We can test this point better by reference to the urban area consisting of Paris and its extensions beyond the walls, since Paris is a city much more uniform in character than London and devoid of large slum areas. In 1911 the infant mortality rates in the central *arrondissements* ranged from 128 to 189 ; in the outer districts they were from 70 to 110, while out at Passy the rate was only 54. When considering the distribution of infant mortality in a town, it must be borne in mind that the children of the wealthier classes are by no means so continuously subjected to the adverse influence as those of the poorer classes. Not only are there occasional and week-end visits to the country, but

[1] The principal districts forming the outer ring are Ilford, East Ham, Barking, Woolwich, Lewisham, Wandsworth, Barnes, Chiswick, Ealing, Willesden, Finchley, Hampstead, Hornsey, Stoke Newington, Tottenham, Walthamstow, Leyton, and Wanstead.

The inner ring consists of West Ham, Greenwich, Deptford, Camberwell, Lambeth, Battersea, Fulham, Chelsea, Hammersmith, Kensington, Paddington, Marylebone, St. Pancras, Islington, and Hackney.

There are no marked exceptions in the distribution described, but the rate in Barking, 97, is exceptionally high for the outer ring. A most interesting object-lesson is afforded by a comparative study of the two adjacent districts of Barking and East Ham. Barking contains a number of large works, and its infant mortality rate has averaged 105 for the three years 1912–14. East Ham is a clean Borough with wide streets and open spaces, and at the time of the writer's visit the only smoky chimney was that of the municipal electric generating station from which great volumes of black smoke were pouring forth. It is but fair to add, however, that the general condition of the streets, every one of which appeared to be lined with trees, showed evidence of excellent municipal administration. The average infant mortality rate in the Borough for 1912–14 was 70.

In the inner ring the rate of 64 in Chelsea was exceptionally low, but in 1913 the rate in this Borough was 90, and for the four years 1908–12, it averaged 99. In the central area the rate in the City of London, 103, was lower than those in the adjacent districts, but the number of births upon which it was based was only 185.

a large proportion of the children are taken away from town during the hottest month of the year, thus escaping a particularly trying period, and increasing their power of resisting adverse conditions on their return. It would be interesting to know how much infant mortality in the West End of London would rise, relatively high though it is, if infants and their mothers saw as little of the country throughout the year as most of the mothers in Bermondsey and Shoreditch.

In Liverpool, Manchester, and most other large cities the same tendency for infant mortality to increase rapidly as the central and most crowded parts are approached is observable.

The Committee for the Investigation of Atmospheric Pollution is at present conducting an exceedingly important investigation into the purity of the atmosphere in various districts, reports on which appear from time to time in the *Lancet*. These results so far show remarkable variations in the amount of solid material deposited in districts not widely separated. Thus in Birmingham Central, the mean monthly deposit amounts to 23·23 metric tons per square kilometre, whereas in the south-west district it is only 6·04 ; in Manchester the deposit is 26·79 tons at Ancoats Hospital, and only 5·69 at Bowden ; in London the measurement is 19·47 tons in the Embankment Gardens, 9·40 at Wandsworth Common, and 8·44 at Ravenscourt Park. As further information accumulates the work of the Committee may prove to be one of the most important Public Health investigations undertaken in recent years.

Besides the large industrial towns, mining districts almost always show high rates of infant mortality, particularly the colliery districts. If a map showing the incidence of infant mortality in England and Wales [1] be compared with a map of the coal-fields, a very marked degree of resemblance will be observed. In these districts there is not only smoke, but dust to pollute the atmosphere. Dr. Fletcher reporting on Chester-le-Street Rural (!)

[1] Such a map will be found in the "Second Report on Infant and Child Mortality," *Supplement to the Forty-second Annual Report of the Local Government Board.*

District has at once drawn a good picture of the conditions and paid a tribute to the miners' wives. He says :—

> As a class, however, and bearing in mind their inferior house-accommodation and depressing surroundings of pit-mounds and black coal-dusty paths, roads and open spaces about their houses, and the general absence of gardens, the miners and their wives deserve credit for their indoor cleanliness and tidiness, a condition the maintenance of which involves much labour in dry and windy weather, when everything becomes smothered with coal-dust.

Dwellers in large towns, even in the better parts, are largely unconscious of the dirtiness of the air which they breathe every minute. The atmosphere may be compared with a great lake of pure water, and the air in towns resembles muddy pools in this lake, with the difference that we can see the mud in the pools, but we cannot see the dirt in the air. We can see it, however, when it has collected in the little masses which are termed "blacks" so freely scattered over our window-sills. Homely illustrations may help appreciation more than statistics of deposits. The housewife well knows how much more frequently she has to change her white curtains in London than in her country cottage; the city man, though he travels first class, and sits in an apparently spotless office, can note the difference in his cuffs and linen between one day in town and a much longer time in the country; the schoolboy who climbs a tree in a London park comes down begrimed, but he may climb trees in the Surrey woods and scarcely show any such effect. We are continually washing, cleaning, painting, and papering the insides of our houses, but we cannot touch a balcony rail outside without making our hands filthy. This is the air which at every breath we take into our lungs, and which is so vital to us that if we are deprived of it for a couple of minutes we die. Can we wonder that it has a poisonous effect upon the untried lungs of the newly-born infant?

The rain of solid particles falls upon us continuously throughout the year, but is far greater in the winter months when more fires are burning; and it is possible that a considerable part of the rise in the general death-

rate which occurs in winter—the increase being particularly marked in diseases of the respiratory system—is not due to the cold to which we attribute it, but to the greater pollution of the atmosphere owing to the larger number of fires. Even more marked is the effect of the black fogs of large towns, a single week of which causes a rapid rise in the death-rate. In this case the moisture has precipitated the dirt in the air and largely concentrated it in the lower layers of the atmosphere.

Our knowledge of the physiology of respiration and of the pathology of pulmonary diseases is still insufficient to enable us to say how a polluted atmosphere exerts its deleterious effect. Until quite recent years it was believed that the harmful factors in ill-ventilated rooms were excess of carbonic acid or diminution of oxygen. Leonard Hill has however shown that this view is no longer tenable, and has established that in close, ill-ventilated rooms the deleterious factors are excessive heat and moisture in the air.[1] But this explanation will not account for the pernicious effect of smoke in the external air, and further research is required to determine whether the harm is actually due to solid particles or to mineral acids, sulphurous fumes, or other noxious gases which accompany smoke. The effects of breathing air containing dust of particular kinds have long been recognised and are significantly described by the terms 'coal miner's lung,' 'knife-grinder's rot,' and 'stone-mason's phthisis.' Post-mortem examinations however show that the lung tissues of all persons who live in smoky towns are impregnated with sooty particles; and it is scarcely a stretch of language to say that in such an environment every one suffers from a modified form of 'coal-miner's lung,' a condition which lessens the power to resist bacterial invasion whether the bacilli are directly inhaled or enter the body through another channel.

We can actually see the injurious effects of a smoky atmosphere in two directions in which we can definitely eliminate other factors. The stone-work of buildings

[1] "Report on Ventilation and the Effect of Open Air and Wind on the Respiratory Metabolism," *Reports to the Local Government Board on Public Health and Medical Subjects* (New Series, No. 100).

becomes extensively corroded in course of time, particularly that of older buildings erected before architects had learnt which stones possess the greatest power of resisting atmospheric corrosion. The effect of a smoky atmosphere on vegetation is very obvious. Few plants grow as vigorously in towns as in pure country air, and many will not survive at all; it is said, for instance, that lichens will not live within several miles of London, and so far the efforts to establish lichens upon the Mappin terraces in the Zoological Gardens have failed. There is no question here of 'maternal ignorance' or 'pre-natal influences,' and the effect is clearly due to some widespread factor in the air, which if so injurious to vegetable life may reasonably be supposed to be harmful to animal life.

In correlation with these facts we may note the importance attached to the open-air treatment of disease, long recognised in the case of phthisis, and now being extended to the treatment of children suffering from infectious diseases, and, as at Cambridge, of wounded soldiers. But if the views of the writer are correct we must distinguish sharply between 'pure' air and 'open' air. We do not provide conditions of health merely by inducing slum-dwellers to keep their windows open, or by lending, under sanatorium benefit, shelters for consumptives to be erected in the back-gardens of smoky towns.

The Pathological Causes of Infant Deaths

We have so far examined the environmental causes of infant mortality, but we can also examine the question from the totally different standpoint of the pathological causes, and we shall find that, using a quite different chain of reasoning and quite different sets of statistics, we can confirm many of the conclusions reached in the preceding pages.

If we enumerate all the diseases and conditions from which infants die we obtain a fairly long list; but most of these are only of occasional occurrence, and, as a matter of fact, by far the larger part of the mortality is brought

about by quite a small number of diseases which fall into the three following sharply-distinguished groups:—

(1) Respiratory diseases mainly pneumonia and bronchitis, but including deaths from measles and whooping-cough, since nearly all fatal cases of these maladies are due to the supervention of pneumonia or bronchitis.

(2) Epidemic diarrhœa and enteritis.

(3) Developmental diseases and malformations, that is, conditions arising from some defect in the child present at birth, a group which will be considered in detail subsequently.

The following table shows the death-rates from these causes in England and Wales, and in the extremes of urban and rural conditions, for the year 1914:—

Pathological Causes of Infant Deaths, 1914

Cause of Death.	Deaths under 1 year per 1000 births.		
	England and Wales.	County Boroughs of North.	Rural Districts of South.
Total respiratory diseases	25·65	35·03	13·86
Pneumonia . . .	10·40	14·03	6·01
Bronchitis	7·75	10·76	4·69
Whooping-cough . .	4·38	5·31	2·14
Measles	2·14	3·77	·27
Pulmonary phthisis . .	·35	·43	·29
Other respiratory diseases	·63	·73	·46
Diarrhœa and enteritis .	17·37	23·54	6·11
Developmental conditions	35·97	39·42	28·84
Other diseases . . .	25·63	31·78	16·72
All causes	104·62	129·77	65·53

It will be noticed that the excess of infant mortality in the County Boroughs over that in the Rural Districts is mainly due to the great increase in deaths from two causes, viz. respiratory diseases and enteritis. The excess from respiratory diseases is 153 per cent, and from diarrhœa 285 per cent; whereas the excess from developmental conditions is only 37 per cent and from other diseases 90 per cent. The class 'other diseases' consists mainly of

non-pulmonary tuberculosis, rickets, convulsions, and so-called overlying, and it is probable that a certain number of these deaths might equally well have been certified as due to respiratory causes. There are reasons for believing, for instance, that a large proportion of the deaths attributed to overlying are really due to respiratory diseases (*v.* p. 298) and 'convulsions' is a purely symptomatic term, the deaths usually resulting from rickets. In view of the possibility discussed on p. 74 that the higher death-rates from measles and whooping-cough in the County Boroughs of the North are due to greater incidence of these diseases owing to increased opportunity for infection, it may be noted that in the County Boroughs of the South, where probably the opportunities for infection are just as great but the atmosphere is distinctly purer, the death-rate in 1914 from measles was 1·07 and from whooping-cough 3·39 per 1000 births.

It is impossible not to correlate the very marked excess of infant mortality from respiratory diseases in large towns with impurities in the atmosphere. It would not be appropriate here to discuss in detail the pathology of the process, but it is most probable that the irritation set up in the lungs renders them peculiarly liable to attacks of micro-organisms.

Epidemic diarrhœa is a disease the exact etiology of which is still obscure. Nevertheless it is definitely established that the disease is most prevalent and fatal in hot dusty weather, the incidence always rising rapidly in the third quarter of the year in all types of districts, though the increase is far greater in the County Boroughs than in the Rural Districts.[1] Dr. Newsholme has repeatedly emphasised the injurious effect of dust blown up from dirty streets, ash-pits, and privies in towns where scavenging is inefficient. It seems probable that the infection is conveyed into the system through food, and it is possible

[1] Dr. Ralph Vincent says: "The higher the temperature of the late summer, the greater the prevalence of the disease, especially if this high temperature be associated with but little rain. In other words, meteorological conditions involving a high temperature with much dust are those which promote the conditions which accompany the greatest incidence of the disease."—*Etiology of Zymotic Enteritis*, 1910.

that the value of breast-feeding arises not so much from an inherent superiority of human milk as from the fact that it affords a pure supply.

The criticism may be made that the writer has ignored climatic differences in comparing the warm and dry south with the relatively cold and wet north, and it may be urged that this is at least partially responsible for the excess of respiratory diseases. To meet this criticism therefore the following table has been compiled for the County Districts of the northern half of Scotland, where, if cold and wet are important factors in producing respiratory diseases in infants, the greatest effect should be observed. The area dealt with consists of the counties of Orkney, Shetland, Caithness, Sutherland, Ross and Cromarty, Nairn, Aberdeen, Elgin, Banff, Inverness, Kincardine, Argyll, Perth, and Forfar for the year 1914, the total number of births being 11,107.

Pathological Causes of Infant Deaths in Northern Scotland, 1914

Cause of Death.	Deaths under 1 year per 1000 births.
Total respiratory diseases	15·50
Pneumonia	6·32
Bronchitis	4·86
Whooping-cough	2·97
Measles	·54
Pulmonary phthisis	·18
Other respiratory diseases	·63
Diarrhœa and enteritis	6·12
Developmental conditions	26·38
Other diseases	19·08
All causes	67·08

We have here a record of the pathological causes of infant mortality under perhaps the most extreme difference of rural conditions as compared with the south of England to be found in the British Isles, yet it will be noticed that the differences in the death-rates are astonishingly small. Deaths from pneumonia, bronchitis, and diarrhœa are almost identical, and the difference in whoop-

ing-cough and measles would probably have disappeared if the statistics had been calculated over a term of years.

Deaths from Developmental Conditions

We must now direct attention to the third great cause of infant mortality, viz. developmental conditions, from which we can learn lessons of entirely different character but of equally great importance. The tables given show that the range of variation in the mortality from developmental conditions does not approach in any degree that exhibited by other causes of death, leading to the remarkable and apparently paradoxical result that in rural districts, although the mothers are the healthiest, developmental conditions form by far the largest single cause of infant mortality, accounting for more than 40 per cent of the total deaths in the first year. In Berkshire and Oxfordshire, the two counties in which the rural infant mortality was lowest in 1914, no less than 111 out of a total of 243 infant deaths were due to developmental conditions.

The actual range of variation in deaths due exclusively to conditions existing at birth is, however, even smaller than that shown by the deaths in the table, since the latter include a small proportion which are really due to the influence of the post-natal environment. In order to bring out this fact and demonstrate the remarkable constancy under all circumstances in the death-rate from conditions present at birth, we must analyse this group more fully.

The term 'developmental conditions' is applied to a group of diseases or structural deficiencies, well recognised by medical men, which consists of the following subdivisions :—

Premature birth.
Congenital malformations.
Atrophy, debility, and marasmus.

The first two are clearly due to conditions operating before birth ; the third is less definite. It is applied to conditions of wasting observed in young infants, not caused by any definitely recognisable disease. In the first

month deaths from atrophy, etc. appear almost always to be due to some deficiency existing at birth, but in the later months it is impossible to distinguish with certainty between the influence of the environment and congenital influences. In order therefore to eliminate as far as possible this element of uncertainty we must measure deaths from developmental conditions not by the mortality in the whole year, but by that in the first month. The following table shows the distribution of deaths from all three causes according to months of the first year :—

Infant Mortality from Developmental Conditions per 1000 Births, 1914

Cause of Death.	Under 1 Month.	2-3 Months.	4-6 Months.	7-9 Months.	10-12 Months.	Total under 1 Year.
Premature birth	17·88	1·57	·24	·03	·01	19·73
Congenital malformations .	2·47	·73	·40	·18	·11	3·89
Atrophy, debility, and marasmus	6·55	3·01	1·79	·70	·37	12·42

The two influences, pre-natal conditions and post-natal environment, really interdigitate to some extent, but the above figures show that by drawing the line at the end of the first month we obtain a fairly sharp line of division ; for in those deaths, even from premature birth and congenital malformations, which occur after the first month we cannot positively exclude the effect of the environment ; while, on the other hand, we know from the earlier investigations that the influence of the post-natal environment in causing mortality is small during the first month.

We have now to examine the death-rates from developmental conditions in the first month under various circumstances. The comparison between urban and rural districts is the most important, but unfortunately statistics are not available to enable the rates in the County Boroughs of the North and the Rural Districts of the South to be compared. The Registrar-General, however, gives the following figures for London, the County Boroughs, other Urban Districts, and Rural Districts for England and

Wales as a whole. We can introduce into the same table another element of variation by including the figures for 1911 as well as those of 1914. The year 1911 was one with a summer heat of almost tropical intensity, and infant mortality in England and Wales rose to 130 ; 1914 was a comparatively cool year and the rate was only 105.[1]

DEATHS FROM DEVELOPMENTAL CONDITIONS UNDER ONE MONTH PER 1000 BIRTHS

Area.	Premature Birth.		Congenital Malformations.		Atrophy, Debility, and Marasmus.	
	1911.	1914.	1911.	1914.	1911.	1914.
London	16·43	16·14	2·58	2·14	5·24	4·41
County Boroughs . .	19·66	19·30	2·21	2·45	7·98	6·78
Other Urban Districts .	18·21	17·76	2·43	2·64	8·07	6·84
Rural Districts . .	17·09	16·77	2·12	2·44	8·49	7·06
All Urban Districts .	18·51	18·16	2·36	2·47	7·58	6·42

We note in this table the small range of variation in the death-rates from developmental conditions, whether we compare different types of areas or years of very different meteorological conditions. London has a small advantage throughout, but this is probably due partly to differences in diagnosis.[2] In any case the range of variation is of a wholly different order from that presented by the total infant mortality in urban and rural areas, or that exhibited by the death-rates from pneumonia and diarrhœa. In the first month the mortality from these two diseases is small everywhere, but is nevertheless 60 per cent higher in London and in the County Boroughs than in the Rural Districts.

We have yet another system of classification which

[1] The writer has preferred to take 1914, since it is the most recent year for which statistics are available, but the contrast between the two years would have been increased by taking 1912, when the infant mortality rate was 95, the lowest on record. As a matter of fact the figures for 1912 are practically identical with those for 1911 or 1914.

[2] It may be noticed that in London deaths certified as due to syphilis, pneumonia, and atelectasis (a condition of collapse of the lungs occurring shortly after birth), though causing in the aggregate only a small mortality in the first month, are all higher than in any other part of the country.

admits of further comparisons, viz. social classes. The death-rates from developmental conditions in the first month according to social classes were tabulated as part of the special investigation undertaken by the Registrar-General in 1911, and the following are his figures :—

Deaths from Developmental Conditions under one Month per 1000 Births in Social Classes, 1911

Social Class.	Premature Birth.	Congenital Malformations.	Atrophy, Debility, and Marasmus.
Middle and upper class .	13·8	2·3	5·6
Shopkeepers, dealers, etc.	16·6	2·0	6·3
Skilled workmen . .	17·1	2·4	6·6
Intermediate workmen .	17·7	2·4	7·0
Unskilled workmen . .	19·0	2·4	8·2
Textile workers . .	19·1	3·0	8·7
Miners	20·3	2·3	9·9
Agricultural labourers .	16·9	2·2	8·1

Again we notice the small range of variation from class to class and the remarkable way in which the figures agree with those given in the preceding table. Unskilled workmen, textile workers, and miners, who are under the worst conditions, show some increase above the upper and middle classes as regards death from prematurity and from atrophy, but it would be almost impossible to determine whether this is due to causes acting on the mother before birth, or to adverse factors in the post-natal environment killing off some prematurely-born infants in the first month, who would have survived, either permanently or until after the first month, if they had received the care and attention they are likely to receive in the upper and middle classes. Statistics showing the mortality during the first week, and still more in the first day, in different social classes would materially assist to determine this point. The smaller number of premature births in the upper and middle classes may also in part be due to some premature births being regarded as still-births, for about one-quarter of the total deaths in the first month occur during the first day, and in those cases where an infant dies very shortly

after birth, perhaps only having made a few movements or convulsive gasps for breath, it is a very fine line which divides live-birth from dead-birth. It is a fact of some psychological interest that many mothers are less distressed at having a miscarriage than at giving birth to an infant which dies immediately; and the slight straining of the law to spare the mother's feelings is perhaps more apt to occur among a class where births are mainly attended by doctors than in a class where they are principally attended by midwives.

The most significant feature of the table is the agreement of the rates among agricultural labourers with those in other classes of manual workers, although, as we have seen, they have so great an advantage over other classes in all other causes of infant mortality.

We have now compared deaths from developmental conditions during the first month in urban and rural areas; in years of different meteorological conditions; and in different social classes, and we find a remarkably constant death-rate running throughout, which presents the strongest possible contrast to other causes of infant deaths. Mortality from this cause appears to bear almost no relation to the external environment of the mother: a very hot year does not send it up; rural conditions do not bring it down; and, even if we assume that the statistical difference between the middle and upper classes and miners represents a real difference, the effect of the best social circumstances over the worst is far smaller than that apparent in other causes of infant mortality. To the writer these facts seem to lead irresistibly to the conclusion that the great bulk of these deaths are due to some obscure internal derangement of normal processes in the mother or infant, which are either independent of the external environment, or are due to some factor or factors in the external environment equally common among all classes and in all environments. It would appear that the structural or physiological defects leading to these deaths really fall into the same category as those minor defects, such as moles, nævi, contracted foreskins, etc., which are exhibited by a certain proportion of children, but do not characterise any par-

ticular class or environment, and do not appear to have any recognisable relation to external conditions. We can write off a small proportion of deaths from premature birth in large cities as due to syphilis, but we know that this is an inappreciable cause of prematurity in rural districts. A few others are due to acute illness or accidents to the mother ; but of by far the greatest number of deaths from developmental conditions we do not know the cause, and we do not know how to prevent this mortality. It would conceivably be possible to reduce the death-rate to some extent by carefully watching every mother from the beginning to the end of pregnancy, providing her with a highly skilled gynæcologist during confinement, and protecting premature infants by means of incubators and other scientific refinements. But these extreme measures are not practicable, and, as we shall see later, all our efforts in this direction have not so far had any appreciable effect in reducing infant mortality. Nor is it certain that the rearing of a certain number of congenitally puny and sickly infants would be of any benefit to the race, for these deaths appear to represent Nature's failures. Just as in every packet of seeds there are some that do not germinate, and in the young of every flock some which do not survive, so it would appear that mankind must inevitably lose a certain proportion of his offspring, and with his present knowledge he cannot hope to prevent this loss. The deaths from developmental conditions in the first month appear to range from 25 to 30 per thousand births, and this probably represents the real natural death-rate which was postulated at the beginning of the chapter. We see here natural selection in operation, uncontrolled and uninfluenced by man's efforts, steadily eliminating the unfit ; and we realise how utterly shallow is the argument sometimes brought forward that by preventing infant deaths we are in the long run injuring the national physique by interfering with natural processes. We cannot save those whom Nature has condemned ; we can only prevent deaths from our own errors.

We have still to examine another class of facts bearing upon this conclusion, particularly the reasons for the

decline in infant mortality during recent years, and the period in the first year at which this decline has occurred. It will be convenient, however, to digress for a moment and examine the subject of still-births since this is so intimately connected with maternal conditions.

Still-Births

Still-births are not registered in this country, and we have consequently no reliable statistics regarding them. Still-births occurring after the twenty-eighth week of pregnancy must now be notified under the Notification of Births Acts, but the law is so incompletely observed—the proportion of notifications ranging from 77·8 per thousand births in Blackpool and 56·1 in Rochdale to 18·3 in Liverpool and 16·3 in Southampton—that no reliable deductions can be drawn from the returns.

Knowledge of the causes of still-births is still very indefinite. Probably a large number are due to inevitable and uncontrollable natural conditions, and some are caused by accident, acute illness, excessive fatigue, etc.; but for the present purpose it is only necessary to consider one cause, viz. syphilis, since it is practically the only one over which the community might exercise some measure of control. Syphilis is generally believed to be responsible for a very high proportion of still-births. Dr. Newsholme in his report for 1913-14 says: "It appears likely that in "the practice of midwives the dead births amount to about "3 per cent of all the births attended by them. Dr. Routh, "on the basis of a wide series of observations by many "authorities over a large field, estimates that abortions at "an earlier period of pregnancy are four times the number "of dead-births. This would imply a total ante-natal "mortality of 150 per thousand births, which is much "higher than the total mortality in the first year after "birth. From evidence published by the Royal Com-"mission on Venereal Diseases, it appears likely that one-"half of this ante-natal mortality is ascribable to syphilis."

It is of course well established that syphilis is an important cause of still-births, and there is no doubt that it

is responsible for a considerably higher pre-natal than post-natal mortality. Nevertheless, in the opinion of the writer the estimate of the Royal Commission is seriously exaggerated. Careful search through the report and volumes of evidence issued by the Commission fails to yield any scientific data in support of the estimate; and it appears to have been based upon personal impressions of witnesses derived mainly from hospital experience in large towns, where, as we know, syphilis is most prevalent.[1] More scientific investigations appear to indicate that the proportion of still-births due to syphilis is considerably smaller. Dr. Whitridge Williams, for example, has found in a study of 705 fetal deaths after the seventh month of pregnancy and *including the first fortnight after delivery*, among 10,000 consecutive admissions of women to the Johns Hopkins Hospital in Baltimore, that in the white women the percentage of these due to syphilis was only fourteen. Among negro women the percentage was thirty-five.[2] It is significant to note that notwithstanding the most painstaking investigation no satisfactory explanation could be found for 18 per cent of the total fetal deaths from all causes.

Much greater investigation of the causes, number, and

[1] The exact statement made in the report is as follows :—" Of registered still-births probably at least half are due to syphilis (Q. 6519, 11,650, 13,040)."

The author assumes that ' registered ' in this statement means ' notified.'

The following were the questions and answers to which reference is given in support of the statement :—

6519. Could you give us any idea as to what proportion of these 3 per cent would be due to syphilis ?—(Sir Thomas Barlow) This is only an impression, but my impression is that the vast majority of them are.

11,650. So that a very large percentage of still-births, nearly half we might say, is due to syphilis ?—(Dr. Florence Willey) Yes.

[Dr. Willey had submitted statistics showing that among 77 still-births occurring in five years in the outdoor practice of the Royal Free Hospital, 24, or 31·2 per cent, were considered to be due to syphilis. In the majority of these cases the diagnosis had been based on clinical evidence only.]

13,040. Would you agree that it is 50 per cent as has been suggested here by a witness ?—(Miss Frances Ivens, M.S.) Yes, I should think quite that.

[In a previous question Miss Ivens stated that she had no statistics.]

It will be noticed that three impressions by persons, each of whom is attached to a hospital in a large town, is the foundation for the sweeping statement in the report. The next stage in the creation of a belief is the issue of circulars and leaflets by philanthropic societies in which the word ' probably ' and references to evidence are dropped; and finally it becomes an established canon that more than one-half of all still-births whether notified or not, are due to syphilis.

[2] " The Limitations and Possibilities of Pre-Natal Care," *Jour. Amer. Med. Ass.*, January 9, 1915.

distribution of still-births is required before we can speak with any degree of certainty as to the future. We may be able to reduce fetal deaths from syphilis, but to the author the outlook for reducing still-births from other causes is not very promising.

The Decline in Infant Mortality in Recent Years

To return to infant mortality. The conclusions we have come to are: (1) that the preventable deaths of infants are those due to conditions in the post-natal environment, mainly smoke and dust in the atmosphere, giving rise to respiratory diseases and enteritis; and (2) that the mortality from developmental conditions, which is almost restricted to the first month, is practically beyond control. If these conclusions are correct, then efforts specially directed towards conditions prevailing before birth and in the first few weeks of life are futile and wasted. The greater part of our efforts to reduce infant mortality, such as the Midwives Act, the Notification of Births Acts, pre-natal clinics, schools for mothers, and infant consultation centres, are of this character, and it will be—as it often has been—claimed that the fall in infant mortality has proved the value of these measures. This point therefore demands very careful investigation.

The following table shows the movements in infant mortality since 1880 in England and Wales:—

Infant Mortality in England and Wales, 1881–1915

Year.	Deaths under 1 Year per 1000 Births.	Year.	Deaths under 1 Year per 1000 Births.
1881–1885	139	1907	118
1886–1890	145	1908	120
1891–1895	151	1909	109
1896–1900	156	1910	105
1901	151	1911	130
1902	133	1912	95
1903	132	1913	108
1904	145	1914	105
1905	128	1915	110
1906	132		

It will be seen that there has been by no means a constant downward trend. The rate for the period 1891 to 1901 was for some unknown reason high as compared with the rate in 1881–85. Thereafter the fall has occurred mainly in two periods. There was an abrupt decline in 1902, and then, with some rise in 1904, the rate remained constant until 1906. Two years of intermediate mortality are followed by another abrupt fall in 1909, and again with an exceptional rise in 1911, and an exceptional fall in 1912, the rate has remained nearly constant to the present year.

It is impossible to correlate those movements with legislative and administrative measures. The Midwives Act was passed in 1902, but did not come into force until 1905; and it did not produce any abrupt change as it took in all midwives then in *bona fide* practice, and it is estimated that even in 1913 more than 50 per cent of practising midwives were untrained women who came in at the beginning.[1] The Notification of Births Act, which is the foundation of modern methods, was passed in August 1907, but it was then an adoptive Act, and several years elapsed before it was at all widely adopted by Local Authorities. Even by the end of 1913 the Act was not in force in 13 County Boroughs, 159 Municipal Boroughs, and 1230 Urban and Rural Districts with a total population of nearly 15 millions. The Act cannot be held to account for the abrupt fall in 1909, for if its very partial adoption during the first two years produced so great an effect, why has not this effect continually increased in subsequent years with the steadily increasing extension of the Act? The growth of schools for mothers, infant clinics, ante-natal clinics, and visiting by health visitors has occurred almost entirely since 1910, and has increased with each year, but the effect on the infant mortality rate seems to have been *nil*.

It is perhaps fairer to test the value of these methods, not by reference to the infant mortality rate for the whole country, but by the rate in a district where they have been

[1] "Report on Maternal Mortality in connection with Child-Bearing," *Supplement to Forty-fourth Annual Report of Local Government Board.*

most zealously applied. Bradford affords a good instance for this purpose. The city was one of the first to adopt the Notification of Births Act, and it has earned a high reputation for the energy it has shown in providing for the care of infant and maternal life. It possesses an ante-natal clinic and maternity hospital, an infant clinic with hospital attached, a system of supplying nursing and expectant mothers with food in order to encourage breast-feeding, a municipal milk depot, and a staff of health visitors, who are in touch with all the departments of the child welfare scheme. We have here a picture of municipal concern for the Public Health which affords one instance in reply to those who assert that Local Authorities are 'neglectful'; and if these efforts are largely wasted and futile, it is not for want of local enterprise and energy, but for lack of an independent, central, investigating authority, whose business it should be to determine the real factors influencing Public Health, afford sound guidance to Local Authorities, and prevent the dissemination of erroneous views.

For what has been the infant mortality record of Bradford? We will examine the rates for the same years as in the previous table.

Infant Mortality in Bradford, 1881–1915

Year.	Deaths under 1 Year per 1000 Births.	Year.	Deaths under 1 Year per 1000 Births.
1881–1885	160	1907	124
1886–1890	170	1908	143
1891–1895	176	1909	116
1896–1900	165	1910	127
1901	168	1911	140
1902	139	1912	99
1903	148	1913	128
1904	167	1914	122
1905	144	1915	123
1906	152		

Comparison with the previous table shows that infant mortality in Bradford has varied almost exactly as it has in England and Wales as a whole. There was a high rate

from 1891 to 1901 ; an abrupt fall in 1902, which continued to 1906, except for a rise in 1904 ; and a further abrupt fall in 1909, which has continued to 1915, broken by the rise in 1911 and the fall in 1912. It is obvious that these variations have not been due to local efforts but to changes in conditions which have prevailed more or less all over England and Wales. When we recall that there are reasons for thinking that a natural death-rate need not exceed 30 per thousand, and that wide areas in all parts of the country exhibit a rate which does not exceed 60 per thousand, it is clear that even if we ascribe the whole decline to the efforts made, these efforts are merely touching the fringe of the problem.

We will complete this investigation by showing at what periods in the first year infant mortality has declined. Unfortunately the Registrar-General did not tabulate deaths in the first month previous to 1905, though we can get earlier statistics for the first three months together. The following table shows the information available for England and Wales :—

Infant Mortality in Periods of First Year, 1898–1914

Year.	Under 1 Month.	2-3 Months.	Total under 3 Months.	4-6 Months.	7-12 Months.
1898	..	..	75·1	35·2	50·1
1899	..	..	76·9	35·7	50·0
1900	..	..	74·2	32·7	47·3
1901	..	..	74·8	32·0	44·5
1902	..	..	68·4	25·8	38·7
1903	..	..	67·6	26·2	37·8
1904	..	..	70·9	30·1	44·3
1905	41·7	24·8	66·6	24·8	36·8
1906	41·9	25·7	67·6	27·0	37·9
1907	40·7	23·3	64·0	21·3	32·3
1908	40·3	24·2	64·4	23·6	32·4
1909	39·7	20·4	60·1	19·2	29·4
1910	38·5	20·0	58·5	18·8	28·2
1911	40·6	24·8	65·4	26·1	38·5
1912	38·4	17·6	56·0	14·8	23·9
1913	39·4	20·3	59·7	19·8	28·9
1914	38·5	19·4	57·9	18·8	28·0

It will be seen that during the first month *the death-rate has been almost constant* for ten years. In the second and third months it has fallen about 20 per cent comparing 1905 with 1914. In the fourth, fifth, and sixth months it has fallen 24 per cent in the same period, and nearly 50 per cent if we go back to 1898. In the period including the seventh to the twelfth month the rate has fallen 24 per cent comparing 1905 and 1914, and again nearly 50 per cent as compared with 1898. It is not necessary to set out similar tables for Urban and Rural Districts, since they present exactly the same characters, the average rate in the first month in the County Boroughs of England and Wales during the four years 1911–14 having been 42·0 ; while in the Rural Districts, in the same period, it was 38·0, again showing how limited is the special effect of an urban environment during the first month. Infant mortality has declined appreciably during the last ten years ; there has been some fall during the second and third months of the first year, but by far the larger part of the decline has occurred during the last nine months of the first year. There is no reason to correlate this decline with efforts specially concerned with conditions during the first few weeks, the death-rate from which has scarcely varied. On the other hand, as we shall see in the next chapter, the fall has been part of a larger general decline in the death-rate, which has been particularly marked during the earlier years of life. We shall see that the death-rate during the second year has fallen 40 per cent since 1895, and that during the third, fourth, and fifth years the fall has been even greater, though no special efforts have been made to protect life at these ages. There seems every reason to believe that the circumstances—natural or social—which have led to the decline in one case have also brought it about in the other.

The fact appears to be that under the term ' infant mortality ' we are classing together two radically different types of deaths, which are brought about by different causes and governed by different influences. The first type consists of deaths due to developmental factors which vary but little from place to place, year to year, and class

to class ; and are caused by fundamental influences which we do not fully understand and apparently cannot prevent. The second type consists of deaths, mainly due to respiratory diseases and enteritis, caused by influences in the post-natal environment, most prevalent in crowded mining and industrial districts, and probably entirely preventable.

These two types of deaths overlap somewhat in time, but the end of the first month gives us a fairly sharp line of division. Some 75 per cent of all deaths before that line are due to developmental conditions, though the proportion among miners, textile workers, and unskilled labourers is rather less ; on the other side of the line the proportion of deaths due to developmental conditions is small. Broadly speaking, mortality in the first month is a special thing which has hitherto baffled us and may continue to do so indefinitely ; mortality after that age is part and parcel of the general mortality, due to the same causes and demanding for its reduction the same measures. For various statistical purposes we must no doubt continue to tabulate deaths according to years of age ; but in future analyses relating to deaths of infants we should do well to drop altogether the misleading term ' infant mortality,' and call mortality in the first month by some such term as ' developmental ' or ' birth ' mortality, and mortality from the end of the first month to the end of, say, the third year as ' mortality of early childhood.' We are at present forcing an arbitrary and artificial classification upon a series of phenomena which fall naturally into quite different classes, and by adopting some such scheme as that suggested we should classify these deaths approximately according to the lines which Nature herself has laid down. Further, we should have a better means of estimating the effect of any particular step, and we should have brought home to us the fact that measures specially directed towards saving life among infants are of very little value, while those which will benefit all children, and indeed all classes of the community, are also those which will reduce mortality in the first year of life.

One final point remains to be considered, and that is

the reason why mortality during the later part of the first year has declined. To ascertain this a prolonged and laborious investigation would be necessary, applying not only to the first year, but to the second and third years. Probably a number of factors, such as better social conditions and prosperity, improved general sanitation, improved methods of medical and surgical treatment, increased institutional treatment, and natural decline in the virulence of certain diseases, have combined to reduce the mortality. The widespread substitution of electric and incandescent gas lighting for the gas flame in street, workshop, and house may have had an appreciable effect in improving the condition of the atmosphere, and possibly explains why black fogs have been less frequent in London in recent years.[1] It would be impossible to allocate to each influence its exact share in the final result, but we may notice the important effect of meteorological conditions upon the death-rate in infants. We have seen that variations in climate between different parts of the British Isles in the same year have very little influence, nevertheless widespread changes over the whole country from year to year have considerable effect. A chart of the infant mortality in England, Scotland, and Ireland shows that for many years the tracings have risen and fallen with a high degree of parallelism, indicating that some influence common to the three countries has year by year affected the rates, and this can only be meteorological variations.[2] We may note this influence on an even larger scale, for the very hot year 1911 was one of high infant mortality in most European countries, while, on the other hand, 1912 saw the lowest rates on record established in Austria, Belgium, Denmark, Finland, France, Germany, Holland, Hungary, Italy, Switzerland, and the United Kingdom. No greater contrast exists than in the

[1] Many housewives who used the old 'bat's-wing' burner will recall that no sooner was a ceiling whitewashed than a grey patch again began to appear above the gas jet, and in a few months the condition of the ceiling was worse than it becomes now after as many years of electric lighting. It is probable that from this change alone the modern nursery of the wealthier classes is much more hygienic than was the nursery of twenty years ago.

[2] The Report of the Registrar-General for Ireland for 1914 contains such a chart beginning with the year 1864.

rates provided by these two consecutive years, and in every country for which later figures are available the rates have risen in succeeding years. We may note that during recent years we have had a remarkable series of mild winters and cool wet summers, broken only by 1911, and it is possible that these conditions have had an important influence in reducing the infant mortality rate.

The Need for Further Research

Whether the views put forward in the preceding paragraphs are correct or not, it is clear that there is still a vast field for research into infant mortality; and it is equally clear that we have adopted a number of expedients without any adequate investigation of the effects they might be anticipated to produce, or examination of their value after they have been in force. We have here the first instance of the way in which futile efforts are made and money wasted to the detriment of Public Health, owing to the lack of a central, independent, investigating authority, specifically charged with the duty of studying all questions relating to Public Health, a function which could only be discharged by a Ministry of Health possessing power to prescribe returns and reports. Statistical investigations such as those in the previous pages are exceedingly laborious; there is little pecuniary reward attached to the work; and it is rarely possible for a private individual to devote to them the time they demand. An immense amount of material for research is already in existence, but is scattered through the reports, statistics, and returns of all countries. If the views expressed are correct, then we should expect to find infant mortality in France, Germany, America, and our Colonies exhibiting essentially the same characteristics, the same difference between town and country, and the same constancy in developmental defects, etc.; and where differences occurred, new light would be thrown upon the subject by ascertaining the causes of these differences. But to examine the vast series of blue-books, reports, and scientific papers is the work, not of one

man, but of a staff. In this country what is most required is a detailed study of a rural district. We have had numerous investigations into infant mortality in large towns, but no one appears yet to have thought it worth while to make an exact study of rural mortality. If we knew the precise causes and circumstances attending, say, even one hundred consecutive deaths under one month in a rural district, we should have some indication whether congenital and unpreventable influences do actually play the large part suggested.

The constitution and functions of a Ministry of Health will be discussed in detail in a subsequent chapter, but we may here anticipate this to the extent of urging that the great function of such a Ministry should be to undertake research into all questions of Public Health, scientific and sociological, but particularly the latter since this field is not, and cannot be, covered by the present Research Committee. Further, this research must be in the hands of those who are unfettered in their judgment and unconnected with administration. At present each Department responsible for the administration of a Public Health measure conducts its own investigations, and in its annual report acts as its own judge, with the result that we too often get views which are biassed and prejudiced. The Registrar-General is the only authority who is entirely independent of administration, and he and his staff are doing by far the most important Public Health research undertaken in this country. Of all the Government Departments, they alone have indicated the right course to adopt in attacking infant mortality. We have many ' experts ' but few ' scientific men.' We may leave administration in the hands of experts, but if we are to avoid great mistakes, useless expenditure, and propagation of erroneous views, we must trust science only in the investigation of Public Health problems.

CHAPTER IV

DISEASE AND DEFECTS IN CHILDREN AND ADULTS

Children below the school age—Physical and mental defects in school children—Defectiveness in urban and rural children—Employment of children out of school hours—Children in special schools and institutions—The folly of palliative methods—Sickness in adults—Urban and rural sickness rates—Defects in army recruits—The principal causes of mortality: tuberculosis; pneumonia and other respiratory diseases; heart-disease; cancer; diarrhœa and enteritis; syphilis.

We can best study disease and mortality in children and adults by considering separately:—children below the school age, children at the school age, army recruits, and the extent and distribution of the diseases causing the greatest mortality and sickness.

Children below the School Age

Following the principle adopted in the previous chapter, we will endeavour to ascertain what unnecessary loss of life is occurring among young children, and where is found the highest mortality, by comparing the death-rates in different types of area in different parts of the country.

Mortality in Early Childhood, 1914

Area.	Age 2 years.	Age 3-5 years.
England and Wales	32·8	8·8
London	35·6	9·5
County Boroughs of North . .	55·7	13·5
,, ,, Midlands .	38·3	10·2
,, ,, South . .	21·7	6·6
Rural Districts of North . .	29·4	7·8
,, ,, Midlands . .	16·6	5·0
,, ,, South . .	11·7	3·8

The preceding table shows the death-rate for the second year of life, and for the age three to five years inclusive (mean annual mortality), in terms of a thousand living at each age.

It will be seen that the distribution of these deaths follows exactly that found for infant mortality, and again we notice the overwhelming effect of urbanisation. In the County Boroughs of the North the death-rate in the second year is nearly five times as high as that in the Rural Districts of the South; and for the age 3-5 years it is more than three times as high. Out of every 10,000 children born in the County Boroughs of the North, 2113 are dead by the end of the fifth year; whereas out of the same number born in the Rural Districts of the South only 870 die in the first five years. The County Boroughs of the South are much more favourable to child life, but it must be remembered that these include many open country towns and sea-coast towns. In noting the relatively high rates in the Rural Districts of the North we must again recall the fact that the word 'rural' in its ordinary meaning is an incorrect description of many of these districts.

In Connaught the death-rate in the second year per thousand living at that age was 12·2; in Belfast County Borough it was 54·7. The Registrar-General for Scotland does not tabulate separately deaths in the second year, an instance of the defectiveness of the Scottish vital statistics, to which further reference will be made.

The total deaths in the second year of life in England and Wales in 1914 were 24,967. Had the death-rate been that prevailing in the Rural Districts of the South, more than 16,000 of these deaths would not have occurred. At the age of 3-5 years the total deaths were 21,039, and of these at least 9085 were presumably avoidable. These losses must be added to the 50 per cent at least of infant deaths which are due to conditions in the environment, and must be regarded as preventable.

We must now examine the chief pathological causes of this mortality. Those responsible for a mortality exceeding ·7 per thousand are as follows :—

[Table

CAUSES OF DEATH IN SECOND YEAR PER 1000 LIVING, 1914

Disease.	England and Wales.	County Boroughs of North.	Rural Districts of South.
Total respiratory diseases	19·24	33·25	5·86
Pneumonia	7·87	13·44	2·66
Bronchitis	2·42	3·81	1·31
Measles	4·86	9·47	·39
Whooping-cough	3·15	4·99	1·11
Pul. phthisis	·48	·83	·21
Other respiratory diseases	·46	·71	·18
Diarrhœa and enteritis	4·21	8·22	·97
Rickets and convulsions	1·78	*	*
Diphtheria	·80	1·21	·18
Violence	·70	·94	·75
Other diseases	6·04	12·09	3·96
All causes	32·77	55·71	11·72

* In these subdivisions of the country, the Registrar-General's tables do not separate rickets and convulsions from 'other diseases.'

Again we notice that respiratory diseases in some form or other constitute the largest cause of death, accounting for more than half the total mortality. Diarrhœa and enteritis come next. In both cases the mortality is reduced to a remarkable extent in the rural districts. It is clear therefore that mortality in the second year resembles closely that in the first year after the first month, both in distribution and causation, and is governed by the same influences.

In the period from the third to the fifth year the proportion of deaths due to other causes increases, but the urban excess of deaths from respiratory diseases and enteritis is even more marked, as shown in the following table:—

CAUSES OF DEATH AT AGE 3-5 YEARS, 1914

Disease.	County Boroughs of North.	Rural Districts of South.
Respiratory diseases	7·09	1·18
Diarrhœa and enteritis	·86	·12
Other causes	5·55	2·50
All causes	13·50	3·80

Thus while respiratory diseases are six times and diarrhœa seven times as high in the County Boroughs as in the Rural Districts, the mortality from all other causes is only slightly more than doubled. It may be noted that neither this nor the preceding table give a complete separation of all deaths in which respiratory conditions played a part, for 'other causes' includes deaths from scarlet fever, diphtheria, rickets, and other conditions the most frequent complications of which, as shown by the Registrar-General's secondary classification, are bronchitis and pneumonia.

We may note further that, as with deaths in the last three-quarters of the first year, there has been in recent years a substantial decline in the mortality in each year from the second to the fifth. In the second year for example the death-rate in 1881–85 was 53·1 per thousand, while in 1914 it was only 32·8 per thousand. This decline has occurred without any special efforts having been made to protect the health of children under the school age, for such children only share to a very limited extent the advantages of the recently established infant clinics, etc., and they do not come under the school medical service. If we had established a medical service of any kind for these children, or taken other special measures, it is highly probable that the fall in their death-rate would have been claimed as a result of these measures. We do not know the reasons for the fall nor the diseases in which it has mainly occurred, and to determine these would be an exceedingly laborious task, though one that might fitly and with advantage be undertaken by a Ministry of Health. Probably various causes, enumerated in the preceding chapter, have combined to produce the final result.

Sickness and Defects in Children below the School Age

Mortality statistics do not tell the full tale of ill-health among children, for there are some diseases which, while not causing a heavy mortality, are nevertheless responsible for much sickness and permanent injury to health and growth. The most important of these affections is rickets,

a disease which is a frequent cause of convulsions in young children, and brings about a softening of the bones, often leading to permanent curvature of the spine, malformation of the chest, ' knock-knee,' ' bandy leg,' and other deformities. A large proportion of the defects for which recruits are refused admission to the army can be traced to rickets during infancy. We do not know the exact cause of rickets, but deprivation of fresh air, exercise, and sunlight, appear to be the largest factors in producing the disease. Defective feeding is perhaps only a subsidiary influence. The disease is very widespread in large cities. Sir William Osler estimates that from 50 to 80 per cent of all the children treated at the hospital clinics in London exhibit signs of rickets. Dr. Lawson Dick, when examining the teeth of 1000 Jewish children attending the L.C.C. schools in the East End of London, found that 80 per cent of them showed distinct evidence of rickets, and he considers that this disease is an important cause of defectiveness of the teeth.[1] It is of interest to note that over 80 per cent of these children had been breast-fed for twelve to eighteen months.

Of other defects in young children we have little statistical knowledge, since no public authority examines these children and records their condition. The Westminster Health Society has however made some valuable observations, and if the children examined represent a fair sample of the poorer population, as there is every reason to believe they do, the observations reveal a terrible state of affairs. The following table is taken from the report of the Society for 1913:—

Defects in Young Children

Age of child	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5
Numbers examined	294	119	120	79	52
	Defects per cent.				
Decayed teeth	..	1·7	16·7	45·6	55·8
Enlarged tonsils	..	6·7	21·7	27·8	30·8
Adenoids	3·0	8·4	20·0	39·2	48·0
Rickets	19·0	24·4	8·3	5·0	1·9

[1] "The Teeth in Rickets," *Proc. Roy. Soc of Med.*, 1916.

A lamentable fact shown in this table is the steady increase in the number of physical defects at each year of age, so that by the time the fifth year is reached more than half the children have at least one physical defect and many have several. From the point of view of health, childhood is probably the most important period in life. If during early years a child is well fed, well cared for, and surrounded by a good environment, vigorous growth will be ensured, and a foundation of health laid which will enable it much better to resist adverse conditions in later years. Children living in large cities are however subjected to harmful influences from the time they are born, with the result that when they come under the school medical officer at the age of five, a large proportion of them are already badly nourished, stunted in growth, and suffering from various defects. The State in its wisdom then begins a half-hearted attempt to correct the evil wrought, and cure defects which need never have arisen if the children had had a better environment in earlier years.

Children of School Age

The death-rate among school children is low. The adverse conditions of early years have by this time nearly completed their work in killing; and their effect on the survivors before and during the years of school life is to be measured by malnutrition, poorness of physique, and defectiveness.

We have now a great mass of information relating to the health of school children as a result of the system of medical inspection which was established under the Education Act of 1907, and this must be examined first. But let us note that 'school children' and 'children of the school age' are not the same; the former are to an appreciable extent a picked class, from which the children who are too ill or too defective to attend school have been separated, and placed in asylums, hospitals, sanatoria, and other special institutions, or simply kept at home. Moreover, the statistics relating to school children deal almost entirely with physical defects, and we have no measure

whatever of the sickness and disease which keeps children temporarily away from school. We cannot attempt to measure the sickness caused by measles and whooping-cough, though we know that the cases of scarlet fever and diphtheria, which are notifiable diseases, amount to many thousands annually.

The total number of children who were medically inspected in England and Wales in 1913-14 was 1,900,000 (of whom 1,395,133 were entrants or leavers), and the total number of those who were found to be suffering from defects or diseases needing medical treatment was 650,000.

The Board of Education has not yet found it possible to compile a table showing the prevalence of defects among the total school population in England and Wales, which amounts to some 5,381,500; but the figures in the preceding paragraph will enable some estimate of this number to be made. The point we have to consider is whether we can justly infer that the proportion of defects in children who were not examined is as high as in those who were examined. A child is not medically examined every year, and it might be supposed that health is better in the years succeeding examination as a result of that examination. The present regulations require the medical inspection of all children in the year they enter school, all children who are between the ages of 8 and 9 years, and all between 12 and 13 years, together with those over 13 who have not already been examined after the age of 12. One of the great advantages which was promised from the system of school medical inspection was "the early detection of unsuspected defects and the checking of incipient maladies at their onset," but it will be noticed that two periods of two years each pass without any medical examination of the child unless for some reason a special exception is made; and if the one examination was at the beginning of the year and the next at the end of the year nearly four years might elapse between the two examinations. During these periods new defects will arise and pass unnoticed unless particularly severe, when the child may have a special examination. Again, detection of a defect by

no means necessarily involves its cure or even an attempt at its cure; for we shall see that only about half the children referred for medical treatment are actually treated, and of these only some four-sevenths are described as 'remedied,' and about two-sevenths as 'improved.' For these reasons it may be assumed that the health of school children during the intervening years is not appreciably better than that during the year of examination; and this view is confirmed by the statistical returns, which show that the proportion of defects found at each succeeding examination is just as high as that at the preceding examination, though no doubt different children figure to a considerable extent in the returns.

Balancing one consideration against another therefore, it may be assumed on the basis of the defects found in the 1,900,000 school children who were examined in 1913–1914, that the total number of defective children in the elementary schools of England and Wales is at least a million and a half, and this is exclusive of physically and mentally defective children in special schools.[1]

The Nature of Defects in School Children

The chief defects found in school children are malnutrition and poor physical development, dental caries, uncleanliness (*i.e.* presence of vermin or nits), defective vision, diseases of the nose, throat, or ears, affections of the heart and circulation, and diseases of the lungs. It may be useful to examine these in detail.

Malnutrition is probably the main cause of stunted growth in height and weight, and of deficient chest measurement—conditions which increase liability to definite diseases. It is not possible to measure malnutrition exactly by figures, since no definite criteria can be laid down, and the judgments and standards of medical officers are bound to vary within wide limits; but when all allowance is made

[1] In his report for 1915–16, Sir George Newman says: "Not less than a quarter of a million children of school age are seriously crippled, invalided or disabled; not less than a million children of school age are so physically or mentally defective or diseased as to be unable to derive reasonable benefit from the education which the State provides."

for this source of uncertainty, it is clear that defective nutrition is widespread among school children, particularly in large cities; and there is no doubt that in many poor districts it actually increases during school life. In London, in 1913, 10·8 per cent of the entrant boys and 9·8 per cent of the entrant girls showed poor and bad nutrition; while among leavers, 14·7 per cent of the boys and 14·3 of the girls showed the same condition. Sir George Newman, the Chief Medical Officer of the Board of Education, says in his report for 1913: "Making allowance for "differences of standard among the numerous school "medical inspectors, it is impossible to doubt the general "result of their findings, that taking London as a whole, "there is evidence that the school child undergoes some "amount of physical deterioration as regards nutritional "condition during school life." It appears therefore that so far all our efforts in the direction of providing medical treatment and meals for necessitous children have not been sufficient even to maintain the relatively low standard exhibited at the beginning of school life. In some of the industrial towns of the North, and in the worst quarters of large cities, the percentages very much exceed those given above. In Bethnal Green, in 1913, the nutrition of 51·9 per cent of the boys and 40·7 of the girls was described as 'poor' or 'bad.' In country districts the proportion is much smaller than in large towns.

We do not know the precise reason why so many city children exhibit malnutrition or defective growth. It is not entirely a question of insufficient or improper feeding —possibly not even mainly—for the condition may be displayed by a child who has always been well fed. Important contributory factors are rickets in earlier years, overcrowding, pollution of the air, want of exercise and proper playing-fields, insufficient sleep, too long hours shut up in class-rooms, and employment out of school hours.[1]

[1] An extreme instance of the effect of these conditions was brought before the Royal Society of Medicine (May 26, 1916) by Dr. Cautley, who exhibited a boy aged 6 years and 8 months. This boy was only 26½ inches in height and weighed only 16 lb. 14 oz.; he was pot-bellied, markedly rachitic, mentally dull, and exhibited numerous defects. *There was no evidence of disease to account for the condition.* Commenting on the case, Dr. Mitchell Smith said: "I agree with the opinion of the chairman. This child has not had a fair chance since its conception.

Defective Teeth.—This is the commonest defect found in school children. The statistical returns from different school areas show a wide range of variation in the percentage of school children who display this condition, but undoubtedly the variation depends to a considerable extent upon the thoroughness and skill with which the teeth are examined. When a group of children are examined by a dentist, with the aid of a reflecting mirror and probe, sometimes not a single child will be found with an absolutely perfect and complete set of teeth. Obvious and serious decay affecting several teeth is exhibited by from 50 to 90 per cent of school children. The condition becomes worse as the child grows older, and at the leaving age many of the permanent teeth are already badly decayed. The condition of the teeth in many young domestic servants and in recruits is often exceedingly defective. The worst effects of decayed teeth are the secondary diseases which they set up, such as abscess of the jaw, enlargement of the glands, which may become tuberculous, digestive disorders, anæmia, and 'rheumatism.' These evils are more manifest in adults than in school children.

We are steadily increasing the number of dental clinics, etc., for curing defectiveness of the teeth, but there is little reason to doubt that the condition could be largely prevented by suitable feeding. Dr. Sim Wallace,[1] Dr. Wheatley, and others have shown that decay of the teeth is mainly due to feeding children on soft, pappy, starch-containing foods, and their excessive eating of sweets. The appearance of the teeth is Nature's indication that the child should be given food which requires chewing, particularly fibrous fruit, at the end of a meal, and where this has been

---

The mother is not a robust woman, and the last four babies were born within a period of three years and four months. In addition to suckling the previous child up to the date of this child's birth, the mother shared her supply between the two children for some time. From 18 months to 3 years old the child was fed on Nos. 1 and 2 Allenbury, and was also given 20 minims of brandy daily to assist its growth. So far as I could ascertain he had no fresh milk till he was over the age of 3 years, and since then he has had one pint or less *per diem*. The child has been equally unfortunate as regards a proper supply of fresh air and sunlight. He has never been in the country, and has spent practically all his life indoors at his home, which is in a poor low-lying district in the Potteries. The home is clean, but ill-lit and overcrowded, and he is only in the fresh air when his mother can find time to take him out in the perambulator."

[1] *Prevention of Dental Caries*, 1912.

done astonishing results have followed. It is an interesting fact that the worst condition of the teeth is found among children in good-class schools. In the poorest schools the children have better teeth and retain their temporary teeth for a longer period, probably because they eat fewer sweets and because, as Sir George Newman has pointed out, neglected children "are left to pursue their natural aptitude for chewing uncooked fruit and vegetables." Here we have probably an instance of real maternal ignorance, but it is doubtful whether many of those appointed to dispel this ignorance are much better informed than the mothers themselves. It will probably be many years before parents cease to regard decay of a child's teeth as inevitable; and abandon the belief that the condition is due to inherited defectiveness of their own teeth.

Uncleanliness in school children, though substantially reduced in recent years, is still widely prevalent. Pediculi appear to be present in rather more than 2 per cent of school children, but nits in the hair are found in over 20 per cent of the children in many schools, particularly among girls, owing to their longer hair. These conditions reduce the general health of the child, the constant irritation is apt to produce nervous disorders, and the scratching of the skin may lead to serious septic conditions. Further, it is possible that infectious disease among children may be spread by vermin.

Other conditions of ill-health met with in school children are diseases of the nose and throat; discharging ears, "the most serious and difficult problem of all the diseases dealt with as 'minor ailments'"; defective vision; and disorders of the heart and lungs.

Defectiveness among School Children in Urban and Rural Areas

As with mortality, the great cause of defectiveness in school children is an urban environment. Industrial towns are the worst, but residential towns show an appreciable excess over rural areas, particularly in the graver

conditions of diseases of the ears, the heart, and the lungs. The following table from Sir George Newman's report for 1914 shows the distribution of defects in the three types of areas, and also gives us a picture of the deplorable condition of school children in industrial areas at the end of school life, in spite of the medical service, feeding, and other efforts at improvement.

Physical condition, etc.	Percentage of defective leavers in		
	14 Industrial Areas.*	15 Residential Towns.†	11 Rural Areas.‡
Uncleanliness of head	21·2	13·7	8·3
Uncleanliness of body	7·8	4·1	3·8
Malnutrition	13·2	11·7	8·9
Diseases of nose and throat	18·1	17·3	15·7
External eye disease	1·9	2·0	1·9
Defective vision	30·5	29·1	19·2
Diseases of ears	2·2	2·4	1·4
Defective hearing	2·8	4·2	1·9
Dental caries	79·7	67·6	66·5
Diseases of heart and circulation	8·0	5·9	2·6
Diseases of lungs	3·8	1·6	1·0

* The industrial areas were: Birkenhead, Bradford, Bury, Hull, Leicester, Manchester, Northampton, Pontypridd, Sheffield, South Shields, Tynemouth. Wallasey, Wallsend, Wolverhampton. Total number of leavers inspected, 56,163.

† The residential towns were: Beckenham, Blackpool, Bromley, Chester, Colchester, Gloucester, Hastings, Margate, Richmond, Salisbury, Shrewsbury, Southport, Taunton, Torquay, Weymouth. Total number of leavers inspected, 10,126.

‡ The rural areas were: Cornwall, Devon, Essex, Norfolk, Oxon, Somerset, Westmorland, Isle of Wight, Wiltshire, Yorks East Riding, Yorks North Riding. Total number of leavers inspected, 45,015.

Rural areas have an advantage throughout, but the greatest difference occurs in diseases of the lungs, which are nearly four times as high in industrial areas, again pointing almost certainly to the influence of smoke. The residential towns show a much smaller increase in diseases of the lungs over rural areas, but we may notice from the list that nearly all these towns were of an open character or were seaside places, and, with the exception of Blackpool, all had low rates of infant mortality. The proportion of children suffering from malnutrition in rural

districts seems higher than might have been expected, but probably each medical officer takes more or less as his standard the average for the district, and if urban and rural malnutrition were both measured by the same standard it appears likely that the difference would be considerably greater. Diseases of the nose and throat, which are mainly enlarged tonsils and adenoids, also cannot be measured by any definite standard.

The causes of defects in school children will not be further examined here, since they are essentially the same as those producing ill-health in all classes of the community. There is, however, one special cause, affecting mainly boys, which may be conveniently dealt with at this point, and that is the employment of school children out of school hours.

Employment of Children out of School Hours

Year after year Sir George Newman calls attention in his annual reports to the harm done among school children by this practice, and strengthens his protests by quoting numerous extracts from reports of school medical officers and teachers. We learn from these that large numbers of boys are employed in delivering milk or newspapers in the early morning hours before school opens, or in running errands or working often late into the evening after school hours. During the war the employment of children has largely increased ; we will not, however, examine the evil under abnormal conditions, but will note some of the instances of such employment, and its effect on health during the year 1914.

The school medical officer for Jarrow reports :—

> Some of these boys go out with papers as early as 5.30 A.M., and many are crying papers until 10 P.M. or later. The teachers tell me that they often fall asleep during morning school and are quite incapable of sustained work. Many of these paper boys work on Saturdays and Sundays, the total number of hours per week reaching 30 or over in quite a number of cases.

From Manchester :—

> 6081 children were employed out of school hours for wages . . . 156 children of 7 and 8 years of age (including 94 girls) are working

out of school hours. Of these 96 (including 52 girls) are going errands, that is, delivering milk, papers, and goods for small shops. Domestic work and 'minding' babies account for 36 girls and 2 boys. Two boys of 8 years of age are engaged in delivering coal from retail coal-yards. . . . The boys not only showed a decided inferiority in mental capacity and attainment, but are also lower, distinctly so, in moral tone. . . . One boy aged 13 works nearly 3 hours before morning school, 3½ hours each evening, 12½ hours on Saturday, and 5 hours on Sunday.

From Plymouth :—

In many cases the boys are suffering physically and mentally from overstrain. Some of them come to school at 9.45 utterly unfit for school work. . . . Children are described as follows : 'Frequently drops asleep in school' ; 'pale and fagged' ; 'nervous and very restless.'

From Tynemouth :—

Incidentally I discovered that there were still certain boys employed as late as 10 o'clock on a Friday night and 11 o'clock on a Saturday night, though this became in March of this year a punishable offence on the part of the employer.

From York :—

There is undoubtedly need for some carefully-planned regulation of the employment of children ; otherwise children are exploited to their excessive fatigue, insufficiency of sleep, arrest of growth, and general physical detriment.

It will be noticed that these reports, and many similar which could be quoted, all refer to running errands, selling goods, etc., in large towns. There is very little evidence in any reports that agricultural employment—at least if supervised—is harmful to boys. The school medical officer for Rutland makes the following report, in which however he does not specifically state the occupations of the boys, though it may be inferred that they were mainly agricultural :—

Ninety-seven children, 87 boys and 10 girls, worked out of school hours, and a careful examination of their condition as compared with other children inspected was made and displayed in a table of percentages. . . . These figures go to show that in the aggregate no harm is done to the children working out of school hours. Nutrition is certainly better among the workers, cleanliness is not appreciably affected, and the condition of the teeth, nose, and throat is distinctly better among the workers.

Most significant too is the report of the school medical officer of Dorset, where the County Education Committee has consented to the employment of children of school age on agricultural work only. He says: "As regards the physical condition of the children who had been exempted for agricultural employment, I was informed by the head teachers that in a number of instances marked improvement had been noticed in the health of the children after being so employed." [1]

The School Medical Officer for Lancashire also finds agricultural work beneficial. He says:—

> Lighter forms of agricultural work such as weeding root crops, potato picking, and milking are not unsuitable for half-time children. Many of our school children are engaged in potato picking annually, and there is no evidence that their health is prejudiced thereby. The children who have been taking the milking classes instituted by the Lancashire Education Committee have improved in health.[2]

The question as to the relative effects on health of different kinds of employment in different types of areas demands further investigation, but these reports appear to show that the evil is mainly one relating to errand work in towns. The writer—who may perhaps unduly prefer the claims of health to those of education—would go so far as to urge, if possible, that all older school children should be turned out of the large towns to work in the fields, under suitable restrictions, during the summer months.

The system of permitting 'half-timers' to work is allowed by law, subject to restrictions relating to hours and conditions of work. If these regulations were strictly observed the practice would still be sufficiently undesirable, but there is evidence in many districts of open and wholesale disregard of the law. The Board of Education report shows that in Liverpool the by-laws had not been complied with in 161 instances among 1059 boys, and 3 out of 17 girls were employed illegally; and the school medical officer at Bromley says, "infringements of these by-laws

[1] Report of Chief Medical Officer to Board of Education for 1915.
[2] *Ibid.*

are at present terribly frequent." The worst case was at Margate, where among 166 boys employed, 114 were illegally employed.

Seventy years ago Lord Macaulay, speaking in defence of a Bill for limiting the labour of young persons in factories to ten hours a day, said : " Rely on it that intense labour, beginning too early in life, continuing too long every day, stunting the growth of the body, stunting the growth of the mind, leaving no time for healthful exercise, leaving no time for intellectual culture, must impair all those high qualities which have made our country great. Your overworked boys will become a feeble and ignoble race of men, the parents of a more feeble and more ignoble progeny. . . . Never will I believe that what makes a population stronger and healthier and wiser and better, can ultimately make it poorer." [1]

Conditions have improved since these words were spoken, nevertheless, though two generations have elapsed, the reports of the Board of Education every year reveal to us that early labour is spoiling the growth and impairing the prospects of large numbers of children in all our great cities.

Children in Special Schools and Institutions

The state of the ordinary school child as shown by the records is bad enough, yet it does not represent the full tale of ill-health among children. As we have noted, the worst cases of defectiveness have been sifted out of the child population, and are to be found in the special schools for mentally and physically defective children, in the institutions for the treatment of tuberculosis, ophthalmia, ringworm, etc., the Poor Law infirmaries, and the institutions of the Metropolitan Asylums Board. Sir George Newman estimated the dull or backward, physically defective, epileptic, mentally deficient, deaf and dumb, and blind children at 131,250 in 1914. In addition there were on January 1, 1915, in lunatic asylums and Poor Law institutions, 18,483 children below the age of sixteen

[1] House of Commons, May 22, 1846.

who were suffering from sickness, accident, or bodily or mental infirmity. In the hospitals and schools of the Metropolitan Asylums Board for sick and debilitated children, and those suffering from ringworm or ophthalmia, 5856 were under treatment during 1914, in addition to 38,862 persons—the great majority being children under fifteen—who were treated in the fever hospitals for infectious disease. In none of these statistics are represented sick or defective children who are kept at home.

The Folly of Palliative Measures

The appalling mass of disease and defectiveness among children represents much pain and misery, and great economic loss to the community, for many of these children are impaired throughout life. And yet the great bulk of it could be avoided. The overwhelming cause is clearly an urban environment, particularly that of large industrial towns, but we do relatively little to counteract this influence. Our efforts to clear slums and establish open spaces are not nearly great enough ; we continue to build our schools in close proximity to gasworks, factories, and noisy main-roads ; and we provide them with stone-paved courts which are wholly insufficient and inappropriate as playgrounds. Instead of attacking the causes of disease, we have established an elaborate and much-vaunted system of medical inspection, which examines a child once in three years in order to detect ' incipient ' maladies ; and an inadequate scheme for medical treatment which only succeeds in reaching about half the children reported as requiring medical attention, and then only classes as ' remedied ' less than 60 per cent of those treated.

The folly of this system is manifest. Preventive measures benefit all classes of the community at once ; curative measures benefit only the one class, and that probably only to a limited extent so long as environmental conditions are unsatisfactory. At present we deal with persons in isolated groups, and we act as though we believed that disease is a different thing in infants, children,

paupers, insured persons, etc., instead of realising that to a large extent the main diseases are the same, and that to a much larger extent the main causes of preventable disease are the same throughout the country in all classes of the community. Palliative measures mean infant clinics, medical inspections, treatment centres, panel services, sickness benefit, hospitals, infirmaries, and sanatoria. Preventive measures are open spaces, larger playgrounds, clearing of slums, segregation of factories, wider streets, increased means of transit, and scattering of the people in crowded areas over outlying districts. It is for the community to choose which it will have.

Sickness in Adults

We possess now a good deal of information relating to the amount and distribution of sickness apart from mortality, from the returns which are issued by Approved Societies under the Insurance Act. We must however note here also that the insured population is selected, and does not give us a true picture of the average health of the community. The Act applies only to the working part of the populace, and the returns do not therefore show sickness among cripples, insane persons, and others prevented by permanent incapacity from coming under its provisions; moreover, it excludes casual labourers, who form one of the unhealthiest sections of the working classes. Further, some three-quarters of insured persons are men, who as a class have a lower average sickness-rate than women. Even for insured persons, the returns do not include that sickness which does not entitle to benefit on the ground that the patient was suffering from a disease the result of his misconduct, or was in arrears with his contributions, or otherwise ineligible. Yet even these incomplete returns have shown that there is an appalling amount of sickness, particularly among women. It is now known that nearly all the women's societies except those consisting of lives above the average, such as domestic servants, are insolvent, in some of them the actuarial estimate having been exceeded by as much as 100 per cent.

Among men's societies many which contain a large proportion of coal-miners, quarrymen, steel-smelters, boilermakers, and others engaged in unhealthy trades have considerably exceeded the standard.

Rural and Urban Sickness

The distribution of sickness teaches the same lesson as that afforded by mortality and defectiveness in infants and children. Unfortunately we cannot express sickness in relation to the same areas as those employed by the Registrar-General for mortality, an instance of uncoordination in Public Health statistics which, as we shall see later, is very characteristic. We must have recourse therefore to the returns issued by individual Approved Societies, and as an example the following average amounts paid per member in different counties by the Manchester Unity Society during the nine months ending July 5, 1914, may be quoted :—

	s.	*d.*
Durham	12	2
Northumberland	10	10
Derbyshire	10	7
Lancashire	10	4
Sussex	7	10
Kent	7	7
Surrey	6	11
Hampshire	6	11

It should be noticed that these figures do not represent the difference between exclusively urban and rural areas, but only those between counties mainly urban and mainly rural. The full difference between rural and urban areas would be even greater than that shown in the table. Moreover, the figures should be corrected for sex and age, the effect of which would probably be still further to increase the difference, since the average age is appreciably higher in rural districts than in towns, and probably there was a larger proportion of men in the Durham and Northumberland societies than in the rural counties. Many other reports could be quoted to show that sickness in urban environments is very considerably higher than in rural areas, but it is not necessary to do this, for indeed the difference

exhibited by the people living in these two types of environment is patent to any observant person who mixes with the working classes. The contrast between the healthy frame of the average country woman and the pallid faces, blotchy skins, and poor physical development of many of the women in the poorer parts of large cities can scarcely escape notice.

It may be observed that since the incidence of sickness is so unequal, the flat rate of contribution under the Insurance Act invalidates the fundamental principle of insurance, which demands equality of payment for reasonable equality of risk.[1] This principle is recognised in the system of fire insurance, premiums being raised when a building is situated in a specially dangerous area or subject to exceptional risk, and lowered where the owner agrees to observe special precautions. But under the Insurance Act rural contributors are paying for the benefits of urban contributors. It is true that in theory rural workers need not lose, since they can form their own societies. But in practice the Act has not worked in this direction, the tendency having been towards the formation of large societies which draw their members from all parts of the country, and grow continually by the absorption of smaller societies. None the less it is the gain on the rural members which compensates or helps to compensate for loss on members in unhealthy towns. It is, indeed, this factor which has kept some societies solvent, for if rural workers had everywhere kept themselves separate, a larger number of urban societies would have been in financial difficulties. Broadly speaking, it may be said that the agricultural South of England is paying for the industrial North; and the ultimate effect is to impose a tax upon the agricultural labourer, the most poorly-paid manual worker in the community, for which he gets no fair return; and upon rural industries, which of all in this country we ought

[1] Mr. Bathurst several times called attention to this effect of the Insurance Act during the debates in the House of Commons. Speaking on the Amendment Bill he said: "As long as the flat rate of payment remains, the agricultural labourers and their employers have a well-founded grievance"; and he supported his views by quoting the experience of "the largest rural workers' Friendly Society in the kingdom," which, on the actuarial estimate, should have received £8200 in the quarter, but did, in fact, receive only £4869.—*Parliamentary Debates*, vol. 55, No. 79.

most to encourage. How little this seemingly obvious development was foreseen may be judged from the following extract from one of Mr. Lloyd George's speeches :—

> The rural workman will be a different being with a powerful organisation at his back. He will no longer tolerate some of the wretched conditions under which he now lives—too often dark and dank cottages held on precarious tenures; too often in many counties miserable wages for long hours—tricked out of his commons by the ancestors of persons who send him to gaol because he traps a hare which may scamper across the commons that belonged to his fathers; land which was formerly his own let out to him reluctantly by the pennyweight as if every grain of it glinted with radium. The first message of real hope that he received was the old age pension. That made him a free man—after seventy. The organisations which he will form under this Act will help to free him for the rest of his life. The labourers of ancient Rome were only allowed to organise themselves for burial purposes. They used those organisations to discuss other matters, including the greatest matter of all. And my own opinion is that these societies formed in rural areas for provident purposes will help eventually to win for the agricultural labourer a treasure more valuable than any you can put in an Act of Parliament—his independence.[1]

These flights of imagination would be harmless in an ordinary person, but when in place of hard facts they influence the actions of one who has power to initiate vast and costly social changes, they demonstrate the necessity of placing consideration of Public Health measures in the hands of those who have some knowledge of the subject.

Defects among Army Recruits

The return of the reasons for which army recruits are rejected gives us some indication of the prevalence of physical defects in the adult male population. Figures are not available for the period of the War, though it is known that the number of rejections has been large, despite a substantial lowering of the standard. The following table from the Board of Education Report gives the chief defects for which recruits were rejected in 1912:—

[1] *Times*, February 13, 1912.

RECRUITS REJECTED FROM OCTOBER 1, 1911, TO SEPTEMBER 30, 1912
Total number inspected, 47,008.

Cause of Rejection.	Rate per 1000 rejected.
Impaired constitution and debility	2·89
Defective vision	21·08
Diseases of eyes and eyelids	1·57
Diseases of nose and mouth	1·64
Diseases of ears	4·32
Deafness	7·25
Loss or decay of many teeth	22·44
Flat-feet	7·30
Malformation of chest and spine	4·25
Under height	5·23
Under chest measurement	29·23
Under weight	3·62
Other defects	112·94
Total	223·77

It will be noticed that nearly one-quarter of all who offered themselves were rejected. The fine appearance of bodies of troops marching through the streets creates in the public mind an impression of the vigour of British manhood. But it is forgotten that these men are selected, and a morning spent with the Medical Officer of a recruiting station will give a very different picture of physical conditions among large masses of the male population in these Islands.

THE NUMBER AND DISTRIBUTION OF DEATHS FROM THE PRINCIPAL DISEASES

This chapter may be concluded by a general examination of the diseases which are responsible for the greatest numbers of deaths. The International List of the Causes of Deaths contains 189 headings many of which have subheadings, nevertheless the great bulk of deaths are caused by quite a small number of diseases or groups of diseases. The following table shows the more important causes or groups of causes which were responsible for mortality in England and Wales in 1914:—

Causes of Deaths in England and Wales, 1914

Respiratory diseases—		
Bronchitis	40,189	
Pneumonia	40,070	
Pulmonary phthisis	38,637	
Measles and whooping-cough	17,184	
Other respiratory diseases	6,109	
Total respiratory diseases		142,189
Diseases of heart		55,107
Diseases of blood-vessels (including apoplexy)		39,822
Cancer		39,517
Premature birth, etc.		35,160
Diarrhœa and enteritis		23,510
Nephritis and Bright's disease		15,912
Non-pulmonary tuberculosis		11,661
Violence		21,440
Old age		30,163
Other causes		102,261
All causes		516,742

We see from this table that, in the aggregate, respiratory diseases account for *more than one-quarter of the total mortality from all causes*; a very significant fact, which shows that in his present environment man's lungs are by far his most vulnerable organs and the most likely to become the seat of disease.

The distribution of the mortality from all causes according to types of area is shown by the following table in which the death-rates have been *standardised*, that is, corrected for differences in age and sex constitution so as to render them comparable:—

Death-Rates from all Causes, 1914

England and Wales	13·6
London	14·6
County Boroughs of North	17·6
,, ,, Midlands	14·9
,, ,, South	12·0
Rural Districts of North	12·6
,, ,, Midlands	10·2
,, ,, South	9·5

We notice that the standardised death-rate in the County Boroughs of the North is 85 per cent higher than that in the Rural Districts of the South.

An examination of the distribution of the causes most frequently responsible for death will indicate the directions in which the greatest scope now lies for preventing disease and improving the Public Health.

Tuberculosis

Tuberculosis is the most deadly disease from which we suffer, being responsible for more than 10 per cent of the total deaths from all causes in the British Isles, and probably for much more than 10 per cent of the total sickness. The following table shows the death-rates from tuberculosis in different types of area :—

Death-Rates per Million from Tuberculosis, 1914

Area.	Males.	Females.
London	2266	1331
County Boroughs of North . . .	2105	1452
,, ,, Midlands . .	1804	1249
,, ,, South . . .	1704	1195
Rural Districts of North . . .	999	944
,, ,, Midlands . . .	925	875
,, ,, South . . .	1067	910

We may notice that the death-rates among males are considerably higher throughout than among females, a fact of much interest, the precise causes of which require further investigation. As regards geographical distribution there is no doubt that the differences in the table appreciably under-represent real differences, owing to the tendency of tuberculous persons to migrate from urban to rural or seaside localities as soon as the disease is detected ; and since illness is usually long enough to lead to the death being registered in the new district, the result is to lower the urban and raise the rural rate. It has long been recognised that the death-rate in the County Boroughs of the South is swollen by the consumptives who migrate to and die in the seaside resorts along the south coast, while deaths in smaller places raise the rural rate.[1] It is known

[1] Dr. Newsholme has discussed this point in his Report for 1912–13.

too that a certain number of young persons who migrate from the country to towns acquire the disease in their new environment, and return to their old homes to die. This would be more likely to happen in the Rural Districts of the South than those of the North, for if a miner develops tuberculosis he will probably die in his native village, but a London servant or shop-girl with a home in the country will probably return there. There can be little doubt that if the statistics for the Rural Districts of the South represented only native cases, the death-rate would be considerably lower even than that shown in the table.

The death-rate from phthisis among coal-miners is lower than that among persons engaged in other forms of mining and unhealthy occupations, which is perhaps another reason why the death-rate from tuberculosis in the Rural Districts of the North approximates more to the general rural rate than do the death-rates from other diseases in these districts. The question of occupation in relation to tuberculosis, with which is probably associated the difference in male and female death-rates, still offers a considerable field for research, though admittedly much has been done in this direction. Tuberculosis, however, is in both sexes essentially a disease of the large industrial towns, and it may be of interest to compare the rates in some of these with those in counties mainly agricultural.

Death-Rates per Million from Tuberculosis, 1914

County Borough or Town.		Administrative County.	
Dublin	3565	Hertfordshire	930
Belfast	3034	Herefordshire	927
Warrington	2265	Surrey	905
Manchester	2240	Wiltshire	884
Salford	2193	Buckinghamshire	884
Gateshead	2140	Dorsetshire	871
Dundee	2130	Gloucestershire	864
Liverpool	2087	Westmorland	679
Glasgow	1990		
Newcastle	1978		
Tynemouth	1911		
Swansea	1879		

The following table from the Report for 1913 of the Chief Medical Officer to the London County Council, showing the rates for the years 1908–12 in certain Metropolitan Boroughs, is also very striking :—

DEATH-RATES FROM PHTHISIS IN CERTAIN METROPOLITAN BOROUGHS

Borough.	Corrected Death-Rate.	Comparative mortality Figure.
London	1·29	1000
Finsbury	2·04	1577
Shoreditch	1·90	1470
Southwark	1·85	1428
Bermondsey	1·82	1405
Holborn	1·81	1400
Stepney	1·74	1346
Paddington	0·96	739
Stoke Newington	0·93	717
Kensington	0·90	699
Wandsworth	0·87	672
Lewisham	0·70	541
Hampstead	0·61	474

As with infant mortality, the highest death-rates are in the central area, and the lowest in the peripheral districts.

PNEUMONIA, BRONCHITIS, MEASLES, AND WHOOPING-COUGH

The distribution of these conditions in 1914 is shown in the table on the following page.

Again we notice in all three diseases the marked difference between urban and rural death-rates, and particularly between the rates in the County Boroughs of the North and the Rural Districts of the South. We notice further, in pneumonia the considerably higher death-rate among males than among females, probably owing to a larger proportion of the former being engaged in dust-producing

Area.	Deaths per million.	
	Males.	Females.
Pneumonia		
London	1502	1009
County Boroughs of North	1962	1331
,, ,, Midlands	1454	1010
,, ,, South	1051	727
Rural Districts of North	1041	760
,, ,, Midlands	762	562
,, ,, South	710	473
Bronchitis		
London	1193	1152
County Boroughs of North	1487	1430
,, ,, Midlands	1315	1228
,, ,, South	947	999
Rural Districts of North	895	887
,, ,, Midlands	910	850
,, ,, South	772	806
Measles and Whooping-Cough		
London	530	490
County Boroughs of North	828	787
,, ,, Midlands	589	589
,, ,, South	268	236
Rural Districts of North	401	438
,, ,, Midlands	228	234
,, ,, South	94	122

occupations, such as quarrying, and cutlery and pottery making.

Diseases of the Heart and Blood-Vessels, Nephritis, and Bright's Disease

This group of diseases stands in marked contrast to those from respiratory affections, in that the death-rate varies very little in different types of area and between the two sexes, though for heart-disease the rate among women is slightly higher than among men. It is clear therefore that the general environment exerts only a minor influence, if any, upon the incidence of these diseases, and the power

of the State to prevent them is limited. Heart-disease and allied conditions are due to a number of causes, including congenital defects, acute illnesses (particularly rheumatic fever), and pathological changes which are frequently associated with heavy and prolonged muscular exertion, syphilis, and alcoholism. State effort might bring about a reduction of deaths from the last two causes, of which syphilis will be examined later. Alcoholism is responsible not only for deaths from heart-disease, but for affections of the liver and other organs, and the habit undoubtedly increases the liability to pneumonia. Prevention of alcoholism is however more a social than a Public Health problem, for action by the State is limited to restriction of the drink traffic, abolition or control of public-houses, and educational measures. Any great or lasting improvement must come from increased self-control among the people themselves. It is for these reasons that not much is said about alcoholism in this book, but it must not be inferred that the writer does not fully appreciate the great amount of disease for which it is responsible.

Cancer

Preventive medicine has unfortunately almost no concern with cancer. We do not know the causes of this disease nor the conditions which lead to it, except that it sometimes follows chronic irritation. Cancer belongs to the domain of the surgeon, who undoubtedly saves large numbers of lives; and all that public authorities can do is to emphasise the importance of early diagnosis and treatment. Geographically the standardised mortality increases with urbanisation, the deaths per million in 1914 having been 864 in the Rural Districts of England and Wales, 976 in the smaller urban districts, 1040 in the County Boroughs, and 1111 in London. These differences however may have been due to better diagnosis and performance of more autopsies in the large towns. Mortality from cancer has apparently been increasing for many years, but again, part at least of this is due to better diagnosis, while

the crude rate has risen somewhat owing to the increasing proportion of persons in the community at ages at which the disease is most prevalent.

Diarrhœa and Enteritis

We have already considered these conditions in infants, among whom three-fifths of the total deaths occur, but it may be useful to tabulate the differences between urban and rural environments for the total deaths.

Area.	Deaths per million.	
	Males.	Females.
London	949	672
County Boroughs of North	1113	855
,, ,, Midlands	899	652
,, ,, South	435	342
Rural Districts of North	819	611
,, ,, Midlands	338	289
,, ,, South	247	213

In London, in 1913, the death-rate of infants under two years of age per thousand births from diarrhœa was 59 in Shoreditch, 42 in Bermondsey, 14 in Stoke Newington, 14 in Lewisham, and 13·5 in Hampstead.

Syphilis

Syphilis, according to the tables of the Registrar-General, was responsible in England and Wales in 1914 for only 2146 deaths, of which 1361 were of children under one year of age. These figures do not however represent the total mortality, partly because the real nature of the death is sometimes withheld from the certificate, and partly owing to the death being certified under some condition, such as paralysis or degeneration of the arteries, to which the disease has led. The ravages of syphilis are to be measured much more by the sickness and pathological conditions it produces than by its mortality, for the disease is not one which kills quickly, and there is probably no

disease—not even cancer—in which the sickness and secondary complications bear so large a proportion to the mortality as syphilis. It may attack and injure or destroy any organ of the body, and the nose, eyes, ears, throat, or skin. It is an important cause of heart-disease, Bright's disease, arterial degeneration, aneurism, paralysis, and insanity; and it appears to be responsible for perhaps 15 to 20 per cent of still-births. As we have seen, it is not a large cause of infant mortality. The Royal Commission on Venereal Diseases estimated that in large cities the number of persons who have been infected with syphilis, acquired or congenital, is not less than 10 per cent of the population, though they point out that they were unable to obtain any positive figures. This is an unexpectedly high estimate, and to the writer the evidence upon which it was based does not appear convincing; but in any case the extent of the disease—though probably exaggerated in the public mind—is sufficient to justify action by the State which seems likely to lead to its reduction.

Syphilis is essentially a disease of large towns. The Commissioners say: "County Boroughs return the highest mortality under each heading in the four divisions of the country dealt with, and are followed at some distance by the smaller towns, while the rural mortality is low in every instance." The experience of practitioners in regard to sickness from syphilis is the same. Witnesses before the Commission stated that in the rural parts of Ireland the disease is practically non-existent, and many practitioners had not seen the disease for years except in an occasional tramp. The worst foci of the disease appear to be the large seaports. In Sweden, where the disease must be notified, the distribution is the same, the incidence of new cases in 1914 having been 2·17 of the population in Stockholm, 0·26 per cent in the smaller towns, and 0·02 per cent in the country districts.

Following the recommendation of the Royal Commission, steps are now being taken to provide free treatment for those suffering from the disease, and in view of the facts that modern discoveries have much improved the methods of treating syphilis, and that the facilities of

higher treatment have hitherto been seriously inadequate among the working classes, this provision should be of considerable value. The criticism may be made however, that since 75 per cent of the cost of treatment is to be met by Government grants, rural districts free from the disease are being made to pay a part of the cost of syphilis in towns; whereas if each locality was obliged to pay the cost of its own sickness—not only from syphilis, but from other conditions—local authorities would have a strong inducement to adopt measures for the prevention of disease.

The prevention of syphilis is a difficult problem, and one which cannot be examined from the Public Health aspect only, since it involves social and moral questions, discussion of which is outside the scope of this book. The giving of lectures and advice to young persons is a desirable measure, as is also the providing of healthy forms of recreation, which witnesses before the Commission stated had had an appreciable effect in reducing the disease among soldiers. Certain prophylactic measures have been enforced in the Navy for a number of years, in the opinion of competent authorities with great benefit; and since 1911 the Board of Trade has encouraged their adoption in the merchant service. The Royal Commission did not however refer to these methods in their report, and since they were required to examine the question from every point of view, it must be assumed that, in their opinion, objections to spreading knowledge of these methods outweighed any advantage to health which might result from them.

The recorded mortality from syphilis fell from 89 per million in 1875 to 51 per million in 1911, though the greater part of this fall was previous to 1901, the figures since that date having fluctuated only between narrow limits. These figures are of course quite useless as an absolute measure, though there is no obvious reason why they should be rejected as an indication of a real decline in the incidence of the disease; the Commission however did not accept the view that they represented a real fall. On this point Dr. Stevenson pointed out that if the actual incidence of the disease had remained constant there are several

important factors which would have tended to increase the recorded death-rate, such as : improvement in diagnosis ; the large increase in the proportion of deaths from all causes which occur in institutions and are more likely to be accurately certified ; and the increase in the proportion of the urban population, which, since syphilis is essentially a disease of large towns, should have markedly increased the death-rate. A further indication of reduction of the disease in the civil population is afforded by the decrease in the proportion of recruits for the army rejected for syphilis, the rate having been 16·5 per thousand in 1873, 6·3 in 1890, and 1·4 in 1911–12. The Commissioners explain the decrease—at least since 1890—in the following words : " It is probable that the signs of the disease are " better known than formerly, and that men recognising " these signs may not offer themselves as recruits. Further, " recruiting sergeants seeing that candidates are diseased " may tell them to get cured before presenting themselves " for medical examination. Again, soft chancre was not " definitely distinguished in the statistics from syphilis till " about 1892, and since 1901 there has been a rise in the " percentage of rejections from ' other diseases of the genital " organs,' which may be due to transference from the cate- " gory of syphilis, thus diminishing the percentage ascribed " to the latter disease." It is difficult however to regard this statement as a convincing explanation of the decline, for the signs of the disease recognisable to the affected man have not changed ; it is impossible to believe that recruiting sergeants can pick out four or five men from the half-dozen or so in every thousand who are suffering from syphilis ; and the report nowhere states the percentage which have been transferred from ' syphilis ' to ' soft chancre.'

Several medical witnesses of wide and long experience expressed the opinion that syphilis has shown a decline both in extent and virulence during the last thirty years, and to the writer the evidence given before the Commission seems to point strongly to this being a sound conclusion. It is difficult to read the report without gaining the impression that, bad as syphilis is, the Commissioners have

made the worst of the case. They appear to have strained the evidence in two directions: increasing on the one hand the number of still-births due to syphilis, and the total prevalence of the disease; and minimising on the other the indications that it has declined. The writer does not presume to question the value of the consideration given by the Commission to difficult social and moral questions; but if his criticisms are justified, they illustrate the disadvantages of entrusting the investigation of purely scientific questions to Royal Commissions, a point to which further reference will be made.

The review in this and the preceding chapter of the state of Public Health in England at the present day shows that the condition of large masses of the population is thoroughly unsatisfactory if measured by the healthiest communities. Mortality among infants and young children is at least twice as high as it need be; defectiveness is widespread among school children; rejections of army recruits are high; preventable diseases claim many thousands of lives; and the death-rates in the rural districts of the Midlands and South show that the present rate for the whole country would be reduced by at least a quarter if the healthiest conditions were universal. We have fallen into the habit of regarding Public Health efforts in this country with some complacency, and it is true that the standardised death-rate has declined 25 per cent since 1881; but when we deduct from this decline that part of it which is due to natural diminution of disease, and that which is due to progress in surgery, it is evident that the results of our vast volume of preventive efforts are still relatively small. It may be that these deaths are preventable only in theory, and that in practice economic conditions forbid the wide adoption of the measures necessary to prevent them; but if this is so, let us at least realise the price we are paying for commercialism—a price which will steadily increase unless radical changes are made in urban environments. In Ireland the crude death-rate in 1914 was 16·5 compared with 14·0 in England and Wales, but the *standardised* death-rate is lower than that in England and

Wales.[1] This result is due to the higher average age of the population owing to the emigration for many years past of young people. In France, with only three-eighths of its population living in towns of 5000 inhabitants and over, restriction of births for many years has led to a death-rate which averages about 18. In this country, also, restriction of births is steadily raising the average age; but when eventually our age-constitution resembles that of France or Ireland, we may expect a higher death-rate than those at present shown by these countries, since so much larger a proportion of our population—already nearly four-fifths—is urban.

Another lesson to be learnt from the distribution of disease is the importance of localisation of effort. Control of the Public Health services is largely central, and we continually pass Acts of Parliament which apply equally to the whole country. But the rural districts do not need these measures—or at least need them to a relatively small extent—and we could safely leave them alone for the present, neither forcing changes upon them nor requiring them to pay for national measures. For instance, to establish a national medical service maintained by Imperial taxation would be one of the greatest injustices we could inflict upon the rural districts. The great centres of disease are London and the large industrial and mining towns, and it is upon these that attention and effort should be concentrated. Probably the best means to achieve this would be to decentralise much of our Public Health machinery, and increase the powers and responsibilities of Local Authorities, proposals which will be examined in greater detail in a subsequent chapter.

We can attack disease by preventive and by curative measures. Preventive measures are indissolubly bound up with questions of land and housing, and we will examine the relation of these factors to Public Health in the next chapter.

[1] *I.e.* standardised in terms of the population of England and Wales.

CHAPTER V

PUBLIC HEALTH, LAND, AND HOUSING

Man not biologically adapted to life in towns—Rural depopulation—The overcrowding of cities and the means of relief—Segregation of factories —Bad housing—The difficulties of clearing slum areas—The cost of building—'Summer camps'—Sleeping out.

Man not biologically adapted to Life in Towns

The deadly effect of urbanisation—particularly its hurtfulness to the organs of respiration in both young and old—possesses a profound biological significance. Zoologists have shown that species only become gradually adapted to their environments as the result of processes which may extend over vast periods of time; and man is not yet biologically adapted to the environment of densely-crowded towns. For hundreds of thousands of years his Paleolithic and Neolithic ancestors lived under natural conditions in plain and forest, with caves, tents of skins, or huts of clay and twigs for habitations. The era of life in cities is only a day in the history of mankind. Even when we reach the period of the so-called 'ancient' civilisations, we can trace little resemblance between their greatest cities, Babylon, Alexandria, and Rome, and the huge aggregations of smoke-covered houses which form the modern centres of industry. How recent is the growth of these, is shown by the fact that as late as the year 1700 the whole population of England was less than that of London to-day.

This abrupt change in man's environment profoundly affected all his habits of life. Previously he had lived a primitive existence in harmony with his structure, breath-

ing pure air and obtaining his food directly from the soil or by the chase. Within a few centuries he developed his commerce, began to use coal, discovered steam-power and the application of electricity, dug his mines, and built his railways. Thenceforth communities were divided into two groups. One group continued to live a healthy life in the fields; the other, and in this country the larger group, abandoned the fresh air for the polluted atmosphere of towns, and devoted itself in dense masses to continuous toil in factory or mine.

But man is not constructed to thrive in this new environment, and its effect upon him is precisely the same as that which we can observe in wild animals in captivity. The death-rate among animals surrounded by unnatural conditions is very high, and often their young can only be reared by taking the utmost precautions. London reads with regret the fate of litter after litter of the cubs of 'Barbara,' the polar bear in Regent's Park, which live at the most for a few weeks and then die from pneumonia. The higher apes suffer severely from tuberculosis, and nearly all the mammalian cubs develop rickets. Man in towns is subjected to the same conditions and suffers only a degree less severely. There is good reason for believing that many of the diseases which he acquires in cities are modern developments. We can only judge of diseases which leave traces in the bones, but rickets was probably unknown among the Neolithic folk, and the teeth of these people were well formed and extraordinarily free from caries.[1]

It might be urged that since man is ultimately governed by natural laws, the change which he has wrought in his environment is part and parcel of his natural evolution. But this assumes that evolution of society and evolution of physical structure are the same; and raises the difficult question of the relations between intelligence and

[1] Professor Keith, describing a number of Neolithic skeletons found in Kent, says: "There is not a single carious tooth to be found in the Coldrum collection. The teeth are regular in their arrangement, the palates were well formed, but in actual size the teeth possess the same dimensions as those of modern English people. All these changes which are appearing in the teeth and jaws of modern British people, arise, we suppose, from the soft nature of our modern diet. We believe that were modern men to resume a Neolithic diet their teeth and palates would again be moulded in the ancient manner."—*Antiquity of Man*, 1915.

instinct in man's development. Mankind did not make the change deliberately and willingly with knowledge of its ultimate extent and effects, but each individual was caught up and carried along willy-nilly in a great flood of 'progress,' which, once started, rushed on uncontrollable. Yet in many little ways we can see that an urban environment is opposed to all man's fundamental instincts, and he is continually rebelling against the surroundings in which he finds himself imprisoned. There is no other species which exhibits the same keen desire to escape at every opportunity from its customary habitat as town-dwelling man. The rich take their holidays in the country, the poor man goes to Epping Forest or Hampstead Heath. Yet other animals pass all their existence in one environment. The forest-loving animal does not seek the plains, the bat shuns the daylight, and the mole thrives in his underground burrow where the squirrel would die. Man alone, forced into one habitat by his work, tries to create another for his leisure. The very term 'bricks and mortar' is used in a sense of reproach, yet there is no logical reason why we should not admire a collection of houses as much as a collection of trees, or why a patch of paving-stones should not appeal to us as strongly as a well-kept lawn. The deep-seated craving for a sight of something green struggles to find expression in the making of gardens around houses, the forming of parks in cities, and the planting of trees in the streets. Even the humblest classes try to introduce some suggestion of the country into their homes. An observant person coming into London by one of the main railways, which is perhaps the best way of realising quickly the grim ugliness and horror of the poorer parts, will continually notice stunted plants on the window-sills or nasturtiums and virginia creeper struggling against the sooty atmosphere. The Biblical chroniclers understood human nature when they placed Paradise in a garden and made the first man a tiller of the soil.

Rural Depopulation

Yet in spite of natural tendencies, the British people, under the influence of commercial development, have been steadily forsaking the fields and flocking into the towns, until the depletion of the country-side has become one of the great tragedies in our history. In 1861 England and Wales had a rural population of 9,105,000 and an urban population of approximately 10,961,000; in 1914 these numbers had become respectively 7,893,000 and 29,068,000. In little more than half a century the rural population, from being nearly equal to the urban population, has become considerably less than one-quarter of the total. In Scotland the rural population, after remaining nearly stationary from 1901 to 1911, has decreased by 55,000 since the latter year, while the population of the burghs has increased by 41,000. In Ireland the population has declined from 5,775,588 in 1862 to 4,381,000 in 1914, mainly as a result of emigration from the rural districts. Thus we have been losing year by year our healthiest and most virile stocks, and have been augmenting the numbers who are exposed to the deleterious influence of town life.

The causes of this decline mainly concern the economist. Probably the largest factor has been the attraction of higher wages offered by industrialism in towns, while insufficient housing accommodation in agricultural districts has played an important part; and lack of opportunity drives the energetic and adventurous to the plains of Australia or the wheat-fields of Canada. We are now fully alive to the dangers and disadvantages of depending for our food-supply upon foreign countries, and it is universally recognised that the future safety and prosperity of Britain depends in large measure upon increased development of agriculture, though whether this is to be done by some scheme of land nationalisation, the 'single tax,' agricultural bounties, duties on imported foods, or development of small holdings, is not within the province of this book to discuss. The only object here is to reinforce the economic arguments by showing that the land question is intimately bound up with that of national

health. It will be of little avail to instruct mothers, or build school clinics, or establish schemes of insurance unless we recognise this fact both in town and country; and when we have recognised it and have acted upon our knowledge, there will be little need for palliative measures. In considering proposals for land development we must be guided, not only by the return of wealth, but by the volume of employment, those measures being most beneficial which give occupation to the greatest number. Schemes which would not yield a material return for some years must necessarily be undertaken by State effort, and of these perhaps afforestation is one of the best. Sir John Stirling-Maxwell has recently uttered a weighty plea for an extensive scheme of this sort, and has pointed out that in Great Britain alone there are some sixteen million acres of sheep ground and deer forest of which probably six millions could be planted.[1] A large scheme of afforestation would provide work under ideal conditions for persons suffering from early phthisis, and for many of those discharged from sanatoria, who now have no choice but to drift back to their old surroundings, where too often the disease reasserts itself with fatal effect. To measure the value of these schemes solely by economic return is seriously to under-estimate their national importance. Development of agriculture, reclaiming of vast areas of marsh and moor in Ireland, and afforestation of millions of acres in the Highlands, in addition to benefiting health, would offer a varied life to the many thousands of the sturdiest stock who now leave our shores every year for the Colonies or the United States.[2]

[1] *The Times*, June 19, 20, and 26, 1916.

[2] In his book, *Land and Labour in Belgium*, Mr. Seebohm Rowntree quotes the following remark made by the Chief Inspector of Forests in Belgium: "Ah, you English, you always want to know will it pay. In Belgium we look at the matter differently. We realise that the afforestation of waste lands affords an enormous amount of healthy work for the Belgian people, work required just when otherwise the men would be unemployed. We realise the importance of providing a large amount of home-grown timber in view of the depletion of the world's timber supply; and we think, too, of the beneficial effects of forests, not only upon climate, but on the soil of the waste lands, to the great advantage of the country."

The Overcrowding of Cities and the Means of Relief

But while much can be done to increase the rural population, we are bound to recognise that we must always remain chiefly an industrial and town-dwelling people; for the greatest sources of our wealth are industries which depend upon our coal-fields and iron-ores, and upon the peculiar fitness of the Lancashire climate for cotton-spinning. We should certainly be a healthier, and probably a happier, people if we became a simple agricultural community, but we need not speculate upon the possibility of this happening.

The problem then is to discover the means by which we can best render our towns fit for human habitation, and the first step is to determine the factor or factors which make our great cities so unhealthy. We have fallen into the habit of talking vaguely about insanitary surroundings, bad housing, insufficient feeding, dirt, and ignorance, forgetful of the fact that all these evils may be rampant in a country village whose inhabitants nevertheless display remarkable vigour. But we need further investigation and much more precise knowledge. On this point the views of the writer have already been expressed, viz. that pollution of the atmosphere by smoke and dust is now by far the largest factor in the causation of preventable disease. More might be done directly to prevent these evils by better scavenging and greater use of smoke-consuming stoves, but our present methods are quite inadequate. There are some restrictions on emission of black smoke, but these are often not enforced; and, with this exception, manufacturers can permit the discharge of volumes of brown and yellow smoke and gases, or fill the air with clouds of dust to the common detriment of the community. Even if the smoke of factories were reduced, it would still be necessary to introduce smoke-consuming stoves into all the homes of the poor in crowded districts, and it is doubtful whether under the best circumstances these measures could ever be enforced sufficiently widely to secure healthy conditions in large towns.

But though we may leave undecided the exact cause of the unhealthiness of towns, we have now quite sufficient knowledge to recognise the type of towns which provide relatively healthy conditions of life. These are towns which, though they may contain populations ranging from twenty to forty thousand inhabitants, are essentially of a rural character. They have not been cramped in their growth, contain no large agglomerations of small streets or smoke-flooded areas, and have wide open spaces and lines of houses straggling into the surrounding country. It is these characteristics which account for the healthiness of many of the towns and watering-places in the South of England and the suburbs all round London. Many such towns exhibit a relatively low death-rate and an infant mortality rate below 80 per thousand, which, though well above the achievable minimum, represents a vast improvement upon the high rates of the industrial cities of the North.

The really serious problem is presented by the manufacturing towns, the great seaports, and the central parts of large cities. The congestion of these is not easily realised by those who are familiar only with the wealthier and better-built parts. Within the London County Council area of 116 square miles are crowded together more than four and a half millions of persons, one-eighth of the whole population of England and Wales, and Dr. Wanklyn, of the London County Council, has estimated that more than 2,365,000 persons are housed in 646,700 tenements of from one to four rooms.[1] There are 168 persons to the acre in Bethnal Green, 166 in Shoreditch, 166 in Southwark, 156 in Stepney, and 144 in Finsbury. On the other hand, all round this closely-packed mass of streets there is a wide expanse of beautiful country, which is but thinly scattered over with villages and towns. The contrast in density of population afforded by this area is striking. Taking the counties immediately adjacent to London and including the County Boroughs and Urban Districts, the density of population per acre is 1·4 in Essex, 8·1 in Middlesex, 1·9 in Surrey, and 1·1 in Kent. Both sets of figures are

[1] "Working-Class Home Conditions in London," *Proc. Roy. Soc. of Med.*, 1913.

based upon the estimated populations in the middle of 1914. Very similar features are exhibited by Liverpool, Glasgow, Belfast, and other great cities and their vicinities.

A good deal can be done to relieve this congestion by increasing the parks and open spaces in cities and forming larger playgrounds for children. The clearing of slums is also all to the good, though the cost renders extensive schemes prohibitive, and it is very doubtful whether the policy of re-covering the cleared areas with blocks of 'model dwellings' and tenements is really sound. The brightly-painted doors and window-frames of these erections give an air of cheerfulness to the exterior which is an improvement on the wretched houses demolished, but the rooms are small, the interiors often lacking in comfort, and the tenants have little in the way of a garden, often a stone court being all that is provided for the whole block. Moreover, though there may be some decrease of chimneys, the great advantage of an open space, from which there is no contribution to the general smoke-cloud, is lost. We could make better use too of the open spaces we actually possess. In many parts of London, and not only the wealthy parts, there are squares the use of which is restricted to a few of the surrounding inhabitants who rarely enter them, while children of the poorer classes have nowhere but the neighbouring streets to play in. Then there are cemeteries and burial-grounds, through some of which paved paths have now been constructed and seats placed round ornamental (!) erections of old tombstones. Respect for the dead requires that these should be treated with reverence, but there need be no violation of feeling if the memorials were removed and re-erected elsewhere. It would indeed be a great gain if all interments within the precincts of cities were forbidden, and all cemeteries and burial-grounds within the boundaries acquired as public open spaces, thus relieving, in one direction at least, the pressure of the dead hand upon the living.

Much more important however is it to develop the policy of taking people right out of the crowded districts and scattering the towns, so to speak, over a much wider

area of country. There is no longer any need for people to live together in dense masses. Our towns were built for bygone conditions, when the science of road-making was unknown and travelling was slow. But the rapid growth of railway, motor, and electric transport has now made our finest cities anachronisms; and our models for the future need no longer be vast cities like Glasgow, with its great docks and its infant mortality rate of 133; Liverpool, with its stately Municipal Buildings and its 1600 deaths a year from tuberculosis; or Dublin, with its Vice-Regal Castle, its Trinity College, and its 20,000 families in single-room tenements; but such places as Letchworth and East Ham, where, though the mansions of the rich are not numerous, the masses of the poor live under healthy conditions. As Walt Whitman says:—

The place where a great city stands is not the place of stretch'd wharves,
docks, manufactures, deposits of produce merely,
Nor the place of ceaseless salutes of new-comers or the anchor-lifters
of the departing,
Nor the place of the tallest and costliest buildings or shops selling goods
from the rest of the earth,
Nor the place of the best libraries and schools, nor the place where
money is plentiest,
Nor the place of the most numerous population.

. . . . . .

Where the city of the healthiest fathers stands,
Where the city of the best-bodied mothers stands,
There the great city stands.

The scattering of a city over a wider area demands broader roads, increased means of transit, and termination of the vicious system of holding up land in suburbs for higher rent. In many industrial towns of moderate size these measures would enable the workers to live outside, and come in daily to their work without undue travelling or expense, but in the largest cities we cannot remove the people unless we remove their work as well. It is pitiful to witness the crowds of tired workers struggling for even standing room in 'bus, tram, or train in many parts of London at the end of the day; and in wet weather the conditions are simply deplorable. To spend perhaps two hours every day travelling in an overcrowded vehicle is a heavy price to pay for a few hours of purer air at night.

But the way out of this impasse has already been shown. At Letchworth in Hertfordshire there has been carried out within the last twelve years perhaps the most successful and instructive social experiment of recent times. A large area of land was purchased by a limited liability company to be developed as a building estate. The enterprise however is not a commercial venture in the ordinary sense of the word, since 5 per cent is the maximum rate of interest which can be paid on its capital, any remaining profits being devoted to improvement of the estate. Houses have been built for all classes and factories established, the latter being one of the distinguishing features of the movement. We are familiar with attractively-built districts, whether called 'garden-suburbs' or not, which are springing up all round London, but these provide residences mainly for the wealthier classes, and factories in them are discouraged. Letchworth is distinguished by its policy of actually inviting manufacturers to move into its area, thus affording numbers of the working classes opportunities to earn their living within easy reach of their dwellings under the most healthy conditions. The population of Letchworth, which is rapidly growing, is now about 12,000, but it is not to be allowed to exceed 30,000, while large areas have been marked off which are never to be built upon.

Segregation of Factories

Yet another lesson can be learnt from Letchworth. The factories there are limited to special districts which are separated from the workers' cottages. This is a principle which could be widely extended. Until the passing of the Town Planning Acts practically no attempt was made to separate factories from residences, except in the districts occupied by the wealthier classes, with the result that each factory has tended to become the centre of a little community which is aroused in the early morning by the shriek of its syren, and lives under the smoke of its chimneys throughout the year. The Town Planning Acts enable Local Authorities to define certain areas for the

erection of factories, but it will be many years before we can substantially alter conditions in our large towns, sweep away our hideous slums, and dot the country round London and other great cities with Letchworths. Nevertheless a beginning has been made, and the interests of national health demand that further efforts should be pushed on with all vigour. Meanwhile, in the towns we could endeavour to undo or avoid some of the mistakes of the past. We need not continue to build schools in close proximity to gas-works or in main thoroughfares, where double windows are necessary to keep out the noise and incidentally such fresh air as there may be ; we need not establish our hospitals and manure-strewn railway sidings within a few yards of each other ; and we need not permit the odours from a pickle factory or a brewery to disseminate themselves through the principal shopping thoroughfares of the metropolis.

Bad Housing

Bad housing is believed to be a fruitful cause of ill-health, and many Acts have been passed in recent years intended to improve the homes of the working classes. The deplorable housing condition of many of the poorer classes both in town and country has been ably described by Geddes, Savage, Booth, Rowntree, and others, as well as in the annual reports of the Local Government Board and the reports of many Medical Officers of Health. Two evils are usually combined, viz. crowding together of too many houses, and bad or dilapidated structure of the houses. For the moment we will examine only the latter, leaving for separate consideration the evil of overcrowding of houses ; and we are concerned simply with the effects of bad housing on health independently of discomfort, demoralisation, and other evils which it causes.

It will simplify the investigation if we note that defects in housing may be divided broadly into two main groups, viz. (1) defects in the sanitary systems, *i.e.* the arrangements for the supply of water and for the removal of waste material, excreta, etc. ; and (2) structural defects, such as

damp walls, leaky roofs, broken floors, low ceilings, and general dilapidation.

Defects belonging to the first group are far more important as a cause of ill-health than those of the second. A pure water-supply is one of the first conditions of health, and we know that if the drinking water is inefficiently filtered, or becomes polluted owing to faults in the service allowing access of sewage to it, grave epidemics may result. Now, speaking generally, the water supplied to all classes of the community in this country is pure. It is true that the supply is often deficient in quantity in poor neighbourhoods, and that the provision of water-taps and baths is frequently inadequate, with the result that cleanliness is sometimes next to impossible, but on the ground of impurity there is little scope for complaint. We can speak with assurance on this point, for we know that certain diseases, particularly typhoid fever, are mainly conveyed by water, and the low rate of incidence to which these diseases have now been reduced is proof of the general excellence of our water-service. This real and great achievement in Public Health has only been rendered possible by municipal control over the water-services, the municipality either providing the supply itself, or exercising supervision over private companies by means of statutory powers and sanitary inspection. The advantage of a pure water-supply is shared by all districts, and in condemning bad housing we must remember that in one exceedingly important respect the humblest home is now in a better position than was many a great and even royal mansion half a century ago.

The sanitary arrangements for the removal of waste water and excreta are also, generally speaking, good. Local Authorities now exercise a very considerable degree of control over these services, and they require many precautions in the nature of trapping, flushing, and soundness of structure of drains, sinks, and water-closets to be observed. In the North of England the sanitary systems are not on the whole as satisfactory as those in the South, insanitary ash-pits still being in considerable use. Rapid progress is however being made in the conversion of ash-

pits, and it may be anticipated that before long, efficient systems will have been generally established in their place.

We may include also, as a sanitary requirement, properly constructed and covered dustbins for household refuse. If these are allowed to become foul they are undoubtedly a cause of ill-health, but the prevention of nuisance arising from them is not so much a question of housing as of frequent removal of contents by municipal authorities.

The fact is that the great bulk of defects which sanitary authorities discover and require to be remedied are structural defects in walls, floors, and roofs. When a house is so dilapidated that it is considered unfit for human habitation the Local Authority, after somewhat complex procedure, can issue a closing or a demolition order, but the number of houses closed or demolished is small in comparison with the number of those in which defects are remedied. The following list from the report of the Medical Officer of Health of a large industrial town in Yorkshire illustrates the type of defects which are most frequently detected by house-to-house inspection :—

Foul walls around house sinks	53
Sinks defective or foul	34
Houses requiring general repairs	31
House roofs defective	30
Eaves spouts or down spouts defective	26
Defective plaster on walls and ceilings	23
Defective ash-pit doors	23
Dirty houses or parts thereof	20
Damp houses	14
General repairs to water-closets	12
Windows not made to open	12
Houses without sinks	10
Choked drains	6
Filthy water-closet apartments	5
Other defects	11
	310

Tables of this sort look imposing, but those who study without bias this particular town, or any similar town, with its squalid and sunless courts, its noisy and narrow

streets filled with children, its dense population, and its infant mortality running up in some districts to nearly 200 per thousand births, will soon realise that the whole of these efforts amounts to little more than superficial tinkering. It is of course easier to deal with this aspect of the housing problem than with clearance of areas necessitating heavy expenditure and interference with vested interests, which the average Local Authority hesitates to undertake. Thus an appearance of activity is created which suggests that far more is being done to improve conditions than is actually the case. "Progress has been made with the Town Planning Acts mainly in the direction of remedying defects," is a statement which appears in the report of the Medical Officer of Health of a large city in a northern county, and is typical of many reports on housing.

But defective housing by itself is probably only a minor cause of ill-health. It is only when the houses are aggregated in large masses that the worst effects arise, and then the evil is due not nearly so much to the defectiveness of the houses as to the overcrowding both of occupants per room and of houses per acre. If we could take out a patch of, say, fifty acres from the most crowded and worst-built district of London, Liverpool, or Dublin and set it down precisely as it is among the pines of Surrey, or on the wind-swept moors of Yorkshire, the probability is that the improvement in the health of the inhabitants would be enormous. There are in fact patches of bad housing in many country towns and villages presenting the worst features of slums whose occupants, nevertheless, exhibit a high degree of healthiness. The agricultural labourer forms the healthiest class of manual workers, yet his bad housing is notorious; and the wretchedly-housed peasants of Connaught, the Highlands, and many parts of rural England exhibit the lowest rates of infant mortality to be found in the kingdom. Sir John Gorst says: "I "have seen magnificent children living in hovels condemned "as unfit for human habitation in the West of Ireland, "models of health and vigour. The explanation was that "they lived almost entirely in the open air. The children

" of gipsies and vagrants who live in tents on commons, " though filthy and untaught, are far healthier in their free, " open-air surroundings than the corresponding class in the " slums of the city." [1] Medical Officers of Health have called attention to the same fact. Dr. Lyster, the M.O.H. for Hampshire, for instance, says: " This [bad housing] is " one of the less important factors in the production of a " high infant mortality, or in the causation of consumption. " . . . The modern requirements as regards housing cannot " be regarded as belonging to the essentials for a healthy " existence, such as food for instance; and we shall only be " endangering our cause by making ill-founded claims of " this kind." [2]

On many grounds improvement of the wretched homes of the poor is an urgent social duty, but do not let us conclude that the mere remedying of structural defects is going to have an appreciable influence in lessening the unhealthiness of cities.

The Difficulties of Clearing Slum Areas

Clearing of slum districts being then of far greater importance than patching of walls, it may be worth while to examine more closely some of the difficulties which hinder widespread adoption of this policy. These are mainly the necessity of recouping part of the expenditure, and the rehousing of the displaced population (or an equivalent number of other persons) partly on the cleared area and partly elsewhere.

The cost of clearance schemes in towns is so great that Local Authorities cannot afford simply to lay out an area as an open space, but find themselves obliged to recover some of their expenditure by re-erecting, on part of the land at least, tenements and shops from which they derive rents and rates. This is a purely economic question with which we are not here concerned, beyond pointing out that in so far as the cost is due to purchase of land it is part and parcel of the larger question which we have seen is so intimately associated with Public Health. We may

[1] *The Children of the Nation*, 1906.
[2] " Housing Problems in County Areas," *Jour. Roy. San. Inst.*, 1912.

note however that the difficulty affords an example of the way in which a Local Authority may be pulled in different directions by different motives, as a result of giving it diverse functions to perform. One and the same body is continually urged to keep down the rates, and at the same time is expected to find large sums of money for the advancement of Public Health. It is for reasons of this kind that the writer has urged in a later chapter that Public Health administration should be separated from other forms of municipal activity.

The necessity of rehousing some of the displaced population arises from the fact that many of these persons are bound to remain near the scene of their daily work. But if the principle, in operation at Letchworth, of moving factories and industries out of towns were more widely adopted, this hindrance to clearing congested areas would become progressively less.

The Cost of Building

We have still to consider the obstacle to rehousing which arises from cost of building apart from that of land. The cost of building is proportionately much greater in rural than in urban areas, for in the latter the tenement system enables a number of families to be housed under one roof on a small piece of land. In the country it is usually necessary to build separate cottages, and the low rents obtainable do not make it profitable for landlords to erect even the cheapest cottages if they are to conform to modern requirements.

But the view may be put forward that we have cultivated an unnecessarily elaborate idea of the dwellings which human beings require for a healthy and comfortable life. We are so saturated with the belief that health depends upon housing that we have created a whole series of building laws and by-laws relating both to material and construction from foundation to roof; and we do not regard a person as properly housed unless he lives in a structure of bricks and mortar, with whitewashed plaster ceilings, papered walls, and the latest

sanitary appliances. Yet, in rural districts at all events, a far simpler and less costly structure would be equally healthy and equally comfortable, and even the sanitary arrangements may be of a primitive character provided the water-supply is free from risk of contamination. The backwoodsman in America builds his hut of logs or planks, and the Scottish crofter and the Irish peasant live in the humblest of habitations. During recent years a movement has grown among the wealthier classes of spending the summer months in buildings of a very simple character. 'Bungalow' towns have sprung up along the south coast, and some of the structures in these are merely old converted railway carriages. Many of the bungalows up the river which are occupied for months together are really only elaborate and ornamented sheds.

The importance of taking masses of the people out of the purlieus of cities is so great that it seems mere foolishness to impede the process by clinging to a notion that human beings must live within bricks and mortar. During the last two years many lessons have been learnt in the rapid construction of 'huts' for soldiers, and these can be rendered quite comfortable and cheerful. Some of the temporary hospitals are simple erections of wood or corrugated iron, built on short piles of bricks so as to avoid cost of foundations, and these have proved quite satisfactory for wounded men. We cannot create a Letchworth in a day, but Local Authorities could rapidly establish 'bungalow' towns, with schools, playing-fields, etc. attached, in the country districts all round large cities.[1] It might be argued that such quarters would not

[1] Mrs. Francis Acland has given the following description of 'Elisabethdorp,' a village constructed in Holland for the benefit of interned Belgian soldiers and their families: "When I visited the place in December 1915, it consisted of ten houses only; this summer, on my second visit, I found a thriving village with over eight hundred inhabitants. There are some hundred houses, extensive carpenters' shops for the men, work-rooms for the women, schools and a crèche for the children; a prosperous vegetable garden; a village bakery and restaurant; a well-equipped hospital. Every building is movable, and immediately after the War will be transported into Belgium. The houses are four-roomed, each family having two rooms; they are built on a strong wooden framework, covered with weather-boarding, and roofed with asbestos tiling, the whole designed so as to take to pieces for transport. Gaily painted, and with flower-boxes at the windows, they present, thanks to the care and pride of their Belgian tenants, a most attractive appearance. Each house, complete with furniture, costs from £100 to £105."—*Daily News*, August 16, 1916.

be suitable for winter, but they can as a matter of fact be made quite comfortable. Those who would oppose them on this ground should reflect again upon the wretched conditions of life in crowded areas which they are intended to replace. A bungalow may not make an ideal home, but at least it is preferable to a tenement in a slum. Again let us recall that only yesterday man was a primitive savage wandering freely over the land, and even to-day—if health were the only consideration—something but little better than a fox-hole would suffice for his home. We cannot provide marble staircases, pictures, and tapestries for the masses, and perhaps after all these only minister to an artificial sense of comfort, but we can secure to them good health, and that with a very considerable degree of comfort.[1]

'Summer Camps'

A modification of the above proposals which might be tested at even less cost, is the opening by municipal authorities of 'summer camps' in the vicinity of towns. These could be largely constructed of canvas, sites and tents being let for small weekly rents. We know that parties of boys often camp out for weeks together in the summer months with great benefit to their health, and the camps would enable many a working man and lad living as lodgers to get away to fresher air after their day's labour.

[1] In connection with these proposals the following paragraph from the report of the chief medical officer to the Board of Education for 1915 may be quoted: "One successful and interesting experiment during the year, in the provision, at a minimum cost, of classrooms of an open-air type in connection with a school for mentally defective children, is worthy of notice. In the autumn of 1915 arrangements were made for the accommodation of boys from the Usher Street and Grange Road Schools at Bradford for mentally defective children, in the grounds attached to the Margaret McMillan School at Thackley. At first the boys' school was conducted as a Camp School under canvas, but on the approach of winter it was decided to erect wooden huts, and these have been constructed by the boys themselves. A number of separate classrooms have been provided with windows on three sides, all of which can be opened if desired. The construction has been reduced to the simplest; no artisan labour has been employed. One of the classrooms was in constant use during the erection of these huts as a woodwork room in which about fifteen of the boys were kept busy making parts of the new rooms. Other boys laid out the garden allotted to the school. The whole enterprise is most creditable and affords a valuable lesson in self-help on the part both of the Authority and the scholars themselves which should not be allowed to pass unheeded."

They would also afford an opportunity for poor working-class families to obtain a cheap holiday during the hot weather when epidemic diarrhœa is at its worst among children in towns. The annual exodus of hop-pickers from the East End of London shows how eagerly any opportunity is grasped by the workers of getting into the country at little cost. If too we are led to adopt some system of national physical training for boys and youths, it might well take the form of requiring them to spend three months of each year, say from the age of fourteen to seventeen, in camp. Our education authorities have in the opinion of the writer devoted too much attention to mental development of children and far too little to physical training. If our schools were provided with adequate playgrounds, the writer would urge that afternoon school should be abolished for children under twelve and the time spent in games in the open air. Possibly the soundest educational movement of recent times, using the words in their broadest sense, is the boy-scout movement, and this we owe not to an educationalist but to a soldier.

Sleeping Out

Incidentally too, we might abolish our absurd laws against sleeping out. Sleeping in the open air is natural and beneficial to mankind. During the War we have heard many accounts of the improved health of the erstwhile city worker, who, often for the first time, has lived under something approaching natural conditions. In New York, during spells of hot weather, thousands of persons are permitted to sleep in the parks and on the neighbouring sea beaches. But in this country if a man has "no visible means of subsistence," and has therefore a double motive for sleeping out, we can put him in prison for so doing. Yet being destitute he is probably in a state of health which makes sleeping in the open air the best thing for him. It is obviously undesirable to permit people to sleep promiscuously in the streets, but there is no adequate reason why the parks in London and other large cities should not be open all night, and homeless persons not only not pro-

hibited but actually encouraged to sleep in them. During the summer months at all events they would be better off than in the casual wards. Those who consider that observance of conventional morality is more important than health, will object to this proposal on the ground that it would afford opportunity for unseemly behaviour. But assuming that this is a real risk, the closing of the parks does not prevent it, but merely drives it elsewhere, satisfying, nevertheless, that type of mind which believes that if an evil is hidden it no longer exists.

We have now examined the main environmental factors in the causation of disease, and we have seen that the land question lies at the bottom of nearly all the forces which make for ill-health, whether they be rural depopulation, holding up of suburban land, continuance of slums, or insufficient housing, for the question also enters into this, through the cost of building materials. Curative and palliative measures alone will never secure a healthy population. We may multiply Medical Officers of Health, sanitary inspectors, and health visitors, and we may establish insurance systems and medical services of all sorts, but unless we deal with the great environmental causes which in large cities are continually producing disease in our midst, we shall still lose our thousands of infants every year, we shall still have our defective school population, and we shall still be ravaged by tuberculosis and other preventable diseases. The majority of the people in these islands—by nature a freely-roaming species—are landless in the country for which they fight and whose wealth they create. Whether the ultimate solution of this great problem is to be found in national purchase or in progressive taxation or otherwise, the words are as true to-day as when they were first spoken that " the only way to get the people back to the land is to get the land back to the people."

CHAPTER VI

MEDICAL TREATMENT AMONG THE WORKING CLASSES

The meaning of 'medical treatment'—The growth and importance of institutional treatment—The insufficiency of institutional treatment—Medical treatment by general practitioners—The size of working-class practices—'Lightning' diagnosis—The absence of expert assistance—Diagnosis in general practice—The lack of laboratories for expert diagnosis—The futility of treatment in a bad environment—The discontent with the panel system—Medical treatment of school children—Mortality in child-bed and its causes—Skilled attendance in child-bed—The pathological causes of deaths in child-bed: puerperal fever—General practitioner or midwife?—Attendance in confinement and infant mortality—Maternity benefit—The question of a public maternity service—Medical treatment and Public Health.

The Meaning of 'Medical Treatment'

We will turn now from consideration of the causes of disease and examine the facilities available among the working classes for medical treatment. It is necessary however, as a preliminary step, to determine the meaning which should be attached to the words 'medical treatment,' and the services which should be included, in the light of modern knowledge relating to the cure of disease.

The history of medicine shows that methods for healing the sick have passed broadly through three stages. The first was the era of superstition, during which diseases were believed to be the work of evil spirits; and charms, rites, and incantations were employed to drive them out of those afflicted. The grosser elements of superstition in this form of treatment have disappeared, but 'Christian Science' and 'Faith Healing' still indicate belief in mystic powers to cure disease. The second stage was marked by the change from belief in magic to belief in medicaments. Evil spirits were succeeded by 'humours,' and the efforts of doctors were directed towards controlling

these or expelling them from the body. The whole animal, vegetable, and mineral world was ransacked to discover new drugs, and we need not go back very many years to find such extraordinary things as unicorn's horn, newts' tongues, and frog's blood being prescribed. There was little scientific knowledge of the mode of action of drugs, and the prescriptions were usually of a blunderbuss character, containing many ingredients in the hope that if one failed another might succeed. This stage has indeed not yet passed. The laity have a widespread belief in the all-sufficiency of drugs, 'tonics,' etc., which leads to an enormous amount of self-medication and to the prodigious sale of patent and proprietary remedies, the vendors of which laud their wares as 'purifiers' of the blood, while 'uric acid' replaces the 'humours' of earlier centuries. The importance still attached to drugs was exemplified in the Insurance Act, under which two out of every nine shillings provided for medical benefit was allocated to the purchase of medicines. Circumstances compel doctors to give a more or less tacit assent to the belief in the efficacy of drugs, though Sir Samuel Wilks is credited with having said that half a dozen drugs would do all that is possible in medicine by the administration of medicaments. Without rigidly limiting them to this minimum, it is probable that most doctors would be satisfied with a mere handful of drugs out of the many thousands which are contained in the Pharmacopœia and Extra-Pharmacopœia.

The third and modern stage of medical treatment is based upon scientific study of disease and of the human body. Exact diagnosis of the malady is the first step, and efforts are then made to cure it which bear, as far as possible, distinct relation to its cause. For these purposes medicine no longer blindly administers nauseous compounds, but calls to its aid physiology, anatomy, chemistry, physics, and other sciences, and at the same time studies the constitution of the patient and his surroundings, including in its treatment suitable dieting, care, nursing, and hygienic conditions. Let us consider what the full medical treatment of a serious case of illness may involve.

For the purpose of diagnosis it may be necessary to employ X-rays, or make a bacteriological examination of the sputum, or a microscopic investigation of a new growth, all methods demanding the highest technical skill and elaborate apparatus. If the patient is admitted to a hospital he is placed under the charge of the physician or surgeon who at first seems most appropriate, but during the course of the illness it may be found necessary to transfer him to a ward for special diseases. If an operation is contemplated, consultations may be held between the physician and surgeon, and either may obtain a special opinion from the oculist or aurist upon some exceptional condition of the eyes or ears. The advice of the gynæcologist may be sought for a woman. Before the operation is undertaken the dentist may be asked to correct faulty condition of the teeth. During the operation the surgeon has the assistance of an anæsthetist, his house-surgeon, and a staff of sisters and nurses, and he may ask any of his colleagues to be present and advise him if necessary. During convalescence the patient may receive various forms of special treatment, such as massage or electrical treatment. Finally the instrument-maker may be required under the supervision of the surgeon to fit him with artificial supports, etc. This procedure, involving as it does co-operation between specialists of the most diverse character, is the only one which can be regarded as providing medical treatment in consonance with modern knowledge.

The growth of medicine during the last half-century has also profoundly affected the medical profession. The volume of knowledge is now so vast that it is far beyond the capacity of even the ablest man to master the whole. Hence specialism has arisen in all directions. Physicians and surgeons were early separated, but the process has now been carried much further. Physicians specialise in diseases of the heart, the lungs, the nervous system, or the digestive system, in children's diseases, mental diseases, diseases of the skin, and tropical diseases. Even a single affection may form a domain by itself, such as tuberculosis, venereal diseases, or gout. Surgeons devote themselves

to the surgery of the throat, nose, and ear, the eye, the brain, the abdomen, the excretory system, the generative system, or the muscles and limbs. Gynæcologists concern themselves with conditions peculiar to women. In quite recent years diagnosis and treatment by X-rays, light rays, electricity, and radium have called into being a new class of specialists who devote themselves to these methods. Besides the clinicians, there are pathologists and bacteriologists who, although they may never see the patient, may be directly responsible for the methods adopted to treat him, as a result of their reports on the excretions, the blood, morbid growths, or micro-organisms.

It is quite clear that for all but the wealthy classes, medical treatment of this character can only be provided through hospitals and institutions. The poor cannot afford to pay the fees of specialists, their homes are not suited for proper care and nursing during serious illness, and facilities for elaborate methods of diagnosis are inadequate. In the middle classes the problem has been partially solved by the establishment of nursing homes, but even with this advantage it is doubtful whether, on the whole, the medical treatment received by these classes is as thorough as that provided for the poor at a large hospital. Medical treatment for serious illness to-day necessarily involves treatment at an institution in which all modern methods are available, if any real meaning is to be attached to the words.

This conception of medical treatment appears to find no place for the general practitioner, but so far from this being the case, his functions are in some respects the most important of those performed by medical men. His primary duty is, or should be, that of diagnosis. Unless the patient goes straight to a hospital, the general practitioner is the first to see the sick person, and upon his correct reading of the complaint may depend the whole future course and treatment of the case. If it is a trivial affection he can treat it himself, if it is a serious disease he should be able to indicate the appropriate institution or form of special treatment most likely to ensure recovery. Error in diagnosis may be disastrous. If a general prac-

titioner regards a case of cancer of the stomach as 'dyspepsia,' strangulated hernia as 'colic,' enteric fever as diarrhœa, diphtheria as sore throat, or early phthisis as a simple cough—mistakes which have all been made with regrettable frequency,—the opportunity of effecting a cure may have been irretrievably lost by the time the error is discovered. The general practitioner should himself therefore be a specialist—a specialist in diagnosis,—and to aid him in this work he should have every facility in the way of laboratories for bacteriological and pathological examinations. It is sheer impossibility for a general practitioner to apply all modern methods of treatment or even to keep himself up to date with new discoveries in treatment; but if he performs the first step of diagnosis efficiently he becomes the channel through which patients suffering from serious illness find their way to hospital, where they can receive the best treatment.

Division of function and co-operation in a scheme in which every one plays a skilled and useful part is in fact the essential characteristic of modern medicine; and a system of medical attendance which consists simply in providing the services of a general practitioner is no more an adequate service than would be a postal service consisting of sorters without postmasters, clerks, telegraphists, and telephonists.

We have now sketched out the division of function among medical men to which growth of knowledge has inevitably led; and we have next to consider how far an organised scheme is in actual operation among the working classes, beginning with the provision for institutional treatment.

The Growth and Importance of Institutional Treatment

The most striking fact about institutional treatment is its remarkable growth during the last forty years or so. We cannot measure this directly by the number of patients treated, since no complete record is even now compiled, but we can gain a very fair idea from the number of deaths

which occur in institutions and are stated in the Annual Reports of the Registrar-General. The following table shows the deaths in institutions in England and Wales for the years 1870 and 1914 :—

Deaths in Public Institutions

Institution.	Percentage of Total Deaths.	
	1870.	1914.
Workhouses and Workhouse Infirmaries	5·6	11·51
Hospitals	2·0	8·41
Lunatic Asylums	·7	2·33
Total	8·3	22·25

We see from this table that in forty-four years the percentage of deaths in institutions has increased by nearly threefold, and that now more than one-fifth of all the deaths in England and Wales occur in public institutions. A better idea of the extent to which institutions are used can however be gained by comparing their distribution in different types of area. The following table shows the distribution according to place of occurrence of the 516,742 deaths which occurred in England and Wales in 1914 :—

Deaths according to Place of Occurrence

Area.	Deaths in Public Institutions.	Deaths in Other Places.
London	30,459	35,578
County Boroughs	44,210	140,962
Other Urban Districts . . .	27,838	137,955
Rural Districts	13,471	86,269

It will be noticed that in London not far short of half the total deaths occur in public institutions, and of these rather more than half are in Poor Law institutions. In the County Boroughs the proportion is rather less than 25 per cent of the total. In the smaller Urban Districts and in the Rural Districts the percentage is very much less, but in gauging the usefulness of institutions it must be remem-

bered that the need for them is appreciably smaller in rural areas than in towns, since the amount of preventable disease is much less, and the proportion of deaths from senile conditions for which medical treatment can do but little, is greater. Moreover, a considerable proportion of the cases which would benefit by hospital treatment come into the towns to receive it.

We can supplement these figures by certain additional facts. In the hospitals of the Metropolitan Asylums Board for infectious diseases, the proportion of patients actually admitted to those legally admissible has grown from 33·6 per cent in 1890 to 87·5 per cent in 1914, and the percentage of admissions is as high in good-class as in poor-class neighbourhoods, which shows that little prejudice exists against accepting free State assistance during illness from these diseases. Institutions are now provided by public authorities for the treatment of ringworm, ophthalmia, epilepsy, and mental diseases; while under the Insurance Act sanatoria for those suffering from tuberculosis are now being established in many parts of the country. These statements refer only to in-patients, but several millions of out-patients must be added to the number of those who receive treatment through hospitals. Education authorities are making arrangements with hospitals for the treatment as out-patients of large numbers of school children, and quite recently the Government has indicated its intention of providing treatment through hospitals for those suffering from venereal disease.

When we reflect upon the vast numbers of persons who either as in-patients or out-patients pass through the doors of our institutions, upon the fact that practically all serious operations among the working classes must be performed in hospitals, and that large numbers of persons suffering from chronic ailments are maintained permanently in infirmaries, it becomes quite evident that the hospitals and kindred institutions form the real backbone of medical treatment in this country. The general practitioners may see a larger number of patients during the year, but it is certain that the hospitals do the great bulk of all the more serious work among the working classes.

A process of evolution has in fact been driving the general practitioner into the place naturally indicated for him in an organised scheme, that of diagnostician, and has steadily reduced the volume of treatment left to him to perform. Thirty years ago an average case of scarlet fever or diphtheria probably meant several weeks' attendance by the doctor and the earning of substantial fees; to-day as soon as he diagnoses the case it is removed to the fever hospital. In many other ways the growth of institutional treatment has been eating into his practice, while the tuberculosis officer, the school doctor, and the registered midwife have deprived him of part of his work in other directions. The decline of general practice was in the very nature of things inevitable, and although the Insurance Act, by the importance it has assigned to medical treatment by general practitioners, has tried to reverse the evolutionary process, it is not likely to have any permanent effect upon the strong tendency towards specialism and institutional treatment.

But there is much need for these facts to be realised by legislators. To speak of 'adequate' medical treatment in an Act of Parliament, and to mean thereby treatment by a general practitioner, is, without in any way reflecting upon the practitioner, simply to play with words. And in the debates on the Insurance Act no one seems to have realised that adequate medical attendance for all serious affections means hospital attendance both in theory and in fact. It was not even until two years after the Act had been passed that the Government, for the first time, made a census of hospital beds in this country, after the necessity had been shown by the Fabian Society. Yet had it not been for the voluntary hospitals, medical benefit under the Insurance Act would have been a farce.

The Insufficiency of Institutional Treatment

But great though the growth of institutional treatment has been, it has not kept pace with the continually-increasing demands of the community, and nearly all large hospitals

have long lists of applicants waiting for admission, most of the cases being in need of surgical treatment. To quote some examples: in 1914 the Western Infirmary in Glasgow, with about 600 beds, had a waiting list of between 700 and 800,[1] and the Royal Victoria Infirmary had a similar list of 1300.[2] The Insurance Act has demonstrated the need of further hospital accommodation, the immediate effect of medical benefit being a much greater demand on the in-patient space of nearly all the hospitals. This was the result of an Act which applied to only one-third of the population, and that the healthiest third, since it consists of people capable of work and mainly of men. Had the Act applied to women and children and the class of casual labourers, it is reasonable to suppose that the increase in the demand for beds would have been very considerably greater. This means that many thousands of women and children are not getting the hospital treatment which a simple sorting out by panel doctors would show them to require. It is estimated that about 50 per cent of the in-patients in the hospitals of the United Kingdom are insured persons. That is, one-half of the accommodation is devoted to one-third of the populace who happen to be under better conditions for having their maladies detected.

The Fabian Society has the credit of having made the first complete survey of hospital accommodation in this country. In their report, published in 1914, they estimated the need for hospital beds at between 2 and 4 per thousand of the population, exclusive of provision for tuberculosis and other notifiable diseases. In Germany provision is made for 5 per thousand in towns and 3 per thousand in the country; in France the minimum is 2 per thousand. In England, according to the report, in not one county does the number of hospital beds reach the standard of 2 per thousand of the population, while in many it falls below 1 per thousand. A rough estimate made by the Local Government Board at a later date showed about 1·3 hospital beds per thousand of the population in England and Wales, or 1·7 including institutions for convalescence. As in the Fabian Society's estimate,

[1] *Hospital*, December 1914. [2] *Hospital*, June 1914.

hospitals for infectious diseases and Poor Law infirmaries are excluded. If we examine special institutions, for example sanatoria for tuberculosis, we find the same story of deficiency.

From these figures it would appear that at least another 17,000 beds are required in England and Wales to bring the proportion up even to the minimum of 2 per thousand of the population. It is important to notice however that the deficiency is by no means equally distributed. The table given on p. 173 shows that the County Boroughs as a whole are far less well supplied than London, and experience shows that even London cannot be regarded as overprovided. It is true that the London hospitals draw some of their inmates from outside the county area, but this is also true of other large towns. The underprovision in rural districts is not so serious having regard to the smaller demand. It is in the large industrial and mining towns, the very places where sickness is greatest and hospital treatment most needed, that the really grave deficiency exists.

Medical Treatment by General Practitioners

Medical treatment, otherwise than through hospitals, is given among the working classes by private practice, panel practice, clubs, medical institutes, dispensaries, and outdoor medical relief. In addition a great deal of medical treatment of a kind is given by herbalists, bone-setters, chemists, and other unqualified practitioners. In their essentials these systems do not differ very much from each other. They all provide practically the same treatment for the same class of patients under the same disadvantages and difficulties. Club practice has been as roundly condemned by doctors as by any other persons; private practice in districts where the fees range from 6d. to 2s. for advice and a bottle of medicine is probably not so good as club practice; and panel practice, as far as patients are concerned, differs little from club practice except that the scope of treatment given is rather more limited. The investigation in the following pages relates mainly to

practice in the poorer quarters of towns, where conditions are often demoralising for the doctor, and treatment futile for the patient. In better-class districts the conditions are not so bad, and in rural districts the efforts of the doctor are aided by the healthiness of the surroundings.

The main reasons why general practice, whether private or contract, is unsatisfactory among the working classes are: (1) many doctors attempt to do a great deal more work than they can possibly manage satisfactorily, with the result that their patients are not properly examined and treated; (2) the facilities for obtaining consultant assistance, or expert diagnosis, or special forms of treatment are very limited; and (3) the environmental conditions of many patients are so bad that medical treatment is often useless, and the doctor, unable to do more, falls into the habit of continually giving medicine as a 'placebo.' In view of the proposals which are now put forward for modifying the panel service or establishing some form of a national medical service it is desirable to examine each of these factors somewhat more fully.

The Size of Working-Class Practices

It is impossible to lay down a hard-and-fast limit to the number of persons one doctor can attend satisfactorily, for this depends upon the amount of sickness in the district, the capacity of the doctor, and the distribution of his practice; but it is well known that many practices are far too large. A considerable number of panel doctors, working without partners or assistants, have 2000 insured persons on their lists; some have 3000, and even 4000 is reached. Most of these are undertaking private practice as well, and if we assume that on the average each insured person connotes one and a half dependents, it follows that a doctor with a panel list of 2000 has actually a total clientele of some 5000 persons. Many instances have been given of the way in which doctors with these large practices rush through their work in order that they may see all their enormous number of patients. Dr. Alfred Salter, speaking in 1914 at a public meeting in support of a

national medical service, stated that he saw "on an average 76 cases in the morning and 92 in the evening. It worked out at $3\frac{1}{4}$ minutes for each patient, $1\frac{1}{4}$ of which was taken up in writing. Patients had to wait on an average $2\frac{1}{2}$ hours for their turn, unless present at the very start." [1]

In an investigation at Cambridge by the Insurance Commissioners into the conduct of a panel practitioner, whose dispenser had written prescriptions and given medical certificates, it was shown that the practitioner's consultations and visits to panel patients in 1914 amounted to 12,457, and that with private patients the total was brought up to 20,660.[2]

It is frequently said that this is a result of shortage of doctors in working-class neighbourhoods; and statistics have been issued to show that while there is one doctor to every five or six hundred of the population in good-class neighbourhoods, there is only one to every two to four thousand in working-class districts, though as a matter of fact the proportion is rarely less than one to three thousand even in the worst-provided districts. But none of these tables are convincing, since they all ignore the hospitals, which appreciably relieve the doctors in the poorest neighbourhoods, while there is no means of computing accurately the number of assistants the doctors may have.

As a matter of fact, large practices are far more due to unequal distribution of patients than to shortage of doctors. In many towns one-fifth of the doctors attend more than half the insured persons.[3] The tendency for the bulk of medical practice in working-class districts to pass into the hands of a relatively small proportion of the doctors, noticeable before the passing of the Insurance Act and equally observable in Germany, is the direct result of 'free choice' of doctor. It might have been supposed that the long delays in crowded waiting-rooms and hurried

[1] *Medical World*, April 1914. [2] *Hospital*, September 18, 1915.

[3] In Bradford in 1913, seven medical men earned from panel practice between £1000 and £1500; two between £800 and £1000; fifteen between £500 and £800; thirty-two between £300 and £500; thirteen between £250 and £300; and twenty-nine less than £50. One practitioner, without a partner, had 4000 insured persons on his list.—*Lancet*, March 14, 1914.

attendance would have led patients to distribute themselves more equally, but this has not occurred. The writer has spent an evening in the surgery of a panel doctor where over seventy patients were seen in the course of three hours. Some of these had been waiting their turn for hours, and towards the close of the evening they were shown into the consulting-room three at a time. A short distance up the street a very capable doctor saw less than a dozen patients during the same evening. The fact is that there is as much fashion in doctors and desire to go to the "best man" in Mile End as in Mayfair, and when once a doctor has earned a reputation, people prefer to put up with any amount of inconvenience in order to see him, rather than go to his less busy but less well-known neighbour. Psychology was forgotten when 'free choice' was given under the Insurance Act. It is important to realise the strength of these tendencies, since some of the impossible schemes for a national medical service seek to retain free choice and at the same time distribute patients among the doctors approximately equally. If free choice is to be observed, we cannot fix any limit to a doctor's practice; and if, on the other hand, excessive numbers are to be prevented free choice must be abandoned.

The 'Lightning' Diagnosis

The immediate effect of attempting to treat such large numbers is to encourage hasty and inefficient work. There is not time to make an adequate examination of the patient, and since the great bulk of those who come to the surgery are suffering from relatively trivial ailments, the doctor jumps to his conclusion after a few questions and a superficial investigation, with the result that serious errors are made from time to time, as Coroners' inquests and reports of Insurance Committees and Approved Societies have shown. The best picture of panel practice under these conditions has been furnished by a panel practitioner himself in the two following letters to one of the medical journals :— [1]

[1] *Medical World*, April 2 and 16, 1914.

Sir,—Much is said about the 'lightning diagnosis' that busy panel doctors must make. I hope Mr. Parker will not be greatly upset when I inform him that I often see from 60 to 70 patients of an evening between 6.30 and 9, *i.e.* an average of one every two minutes. And yet it is very simple. Each patient on entering the surgery is presented with a numbered ticket by my nurse. This, I may say, is much appreciated and prevents confusion and waste of time. I have already seen, during the past week, nine-tenths of my to-night's visitors. To my question, "How are you getting on?" the answer as a rule is, "Very well, but I think another bottle would help me more." The prescription is ready as they utter the last word. A number want documents signed, leaving me plenty of time to thoroughly examine the seven new patients. "But they are all trivial cases," I think I hear some one say. Is not almost every deviation from the path of health trivial? Let us look at a few of our to-night's 'trivial' cases. No. 1, chill; No. 2, eczema; No. 3, dyspepsia; No. 4, alveolar abscess; No. 5, chill; No. 6, sprain ankle; No. 7, ulcer leg; No. 8, injury to foot; No. 9, chill; No. 10, chronic nasal catarrh; No. 11, neuralgia; No. 12, chill; No. 13, dyspepsia; and so on. Who will say that one of these is trivial?

Yours, etc.,

An Old Hand.

In a second letter the 'Old Hand' lets us more fully into the secret of his methods. He says, in reply to criticisms:—

Thanks to an excellent training at the 'London' in the 'spotting class' (20 years ago), plus a study of the methods of Dr. Bell (Sherlock Holmes), it does not take long to sum up a patient. When to these are added the mastication and assimilation of such books as *Malingering, Emergencies of General Practice*, the latest books on skin, eyes, ear, etc., I am equipped for my night's work. My to-night's new patients number seven. The first is 'indigestion.' I hand the patient a printed slip, 'What to eat and what to avoid,' and ask him to keep it for reference. After a few enquiries as to the kind of indigestion I hand him my prescription. No. 2, urticaria. I knew at once, in this district, that fried fish is most likely the cause. I tell her that two days ago she had fried fish for supper; she admits the soft impeachment, and with a little good advice she departs, happy in mind that it is not S.F.[1] No. 3, neuralgia. It ranges between temple and jaw. The offending molar is at once detected, and a visit to the dentist advised. Nos. 4 and 5, chills; quick pulse—"½ min. thermometer." "Go to bed at once; take the medicine, and I shall call to-morrow to see you." No. 6, a man hobbles into the surgery—injury to foot. I inquire kindly, "Why

[1] Scarlet fever.

didn't you send for me?" "I thought I could save you the trouble of calling." (Bless them! Almost without exception they wish to 'save trouble'; they are very good.) I advise the man to go home and I will follow at the close of surgery. No, 7, lumbago.

It would be unfair to class all panel practitioners with the 'Old Hand,' nevertheless he describes a type of conditions which is far too common. Six out of his twenty cases mentioned are diagnosed as 'chill,' to be seen tomorrow, but meanwhile medicine prescribed; the patient's own statement that she requires more medicine is accepted without question and the prescription given at once; the newcomer's own diagnosis of indigestion received without examination and medicine ordered; printed slips kept in order to save the time of verbal advice; while the one useful service which would have been worth all the prescriptions, viz. extraction of the 'offending molar,' is not performed. We can understand how with these methods the 'Old Hand' gets through his large number of cases, but it is not easy to see when he manages to 'masticate and assimilate' the 'latest books on skin, eyes, ear, etc.' and how these assist him.

These large practices are generally mixed private and panel, the treatment given to private patients being essentially the same; but instead of a prescription the private patient receives a bottle of medicine, usually drawn from a 'stock-mixture' made up in large quantities for all and sundry, the fee for advice and medicine averaging about a shilling. Such practices can only be carried on by means of a machine-like system, and the doctor has rarely time to read current medical literature or keep proper medical records of his cases. Minor surgery is performed in a manner which would horrify a surgeon. There is no time to sterilise properly instruments, hands, or skin. The writer on one occasion saw a doctor at the close of three hours' surgery open a deep abscess in the breast by an incision an inch and a half long. The knife was just dipped into a weak solution of carbolic acid, no attempt was made to sterilise the skin in any way, and there was no suggestion that the patient should have even a local anæsthetic. The girl paid her shilling, but refused to let

the doctor call the next day, as she could not afford a further fee.

The big panel and dispensary practices are exceedingly lucrative, but they are demoralising to both patients and doctors. It is but fair to recognise however that in many smaller practices and in large practices where sufficient medical assistants have been engaged, considerably better treatment is given.

The Absence of Expert Assistance

The poor cannot afford the fees of consultants, and no provision is made under the Insurance Act for this form of assistance, so freely sought in better-class practice. The doctor therefore, unless he sends his patient to a hospital, must rely upon his own knowledge for diagnosis and treatment in every form of difficulty. He must be surgeon, physician, and gynæcologist in one; he must undertake the treatment of grave cases which emphatically ought to be in hospital; advise on the feeding, care, and treatment of infants; attend women in pregnancy and childbirth; do his best for patients waiting for surgical operation; give anæsthetics for a brother practitioner, and attend many cases of infectious disease in children. For the purposes of diagnosis he should be able to employ, and have time to employ, scientific instruments of precision, such as the ophthalmoscope and the laryngoscope, the use of which he learnt in his student days. He should be capable of making skilled investigations of the blood and the excreta. Finally, he may be called upon in an accident or emergency to perform almost any service in the whole range of medicine or surgery. Besides his purely clinical duties the modern doctor must observe a long series of legal obligations, rules, and regulations relating to notification of disease, keeping records, giving of certificates, etc. We are accustomed to regard specialism as demanding the higher degree of mental attainments, but as a matter of fact the specialist, limited to one subject, does not embrace anything approaching the wide and

varied volume of knowledge expected of the general practitioner.

Besides being unable to obtain expert medical assistance, the doctor is further handicapped by absence of the accessory but exceedingly important aids to medical treatment which are at the command of the wealthier classes, such as skilled nursing and invalid food ; and he may have to attend his patient in a sick-room which is small, noisy, dirty, and depressing.

Diagnosis in General Practice

Considering the circumstances of general practice in poor urban areas, it is not surprising that serious mistakes are made by doctors. We have already noticed the importance of accuracy in diagnosis, and it is probably in this respect that most errors are made, partly owing to insufficient facilities for skilled methods, and partly owing, it must be admitted, to failure of the doctors to utilise these facilities when they are available. In regard to phthisis in children, for example, Dr. Hugh Thursfield, of St. Bartholomew's Hospital, writes : " In the course of a year I have to examine a large number of children who have been certified as the subjects of pulmonary tuberculosis, and I do not exaggerate if I say that in at least two-thirds there is no evidence whatever of the existence of the disease." [1]

The statistics of erroneous diagnosis made by doctors when notifying cases of infectious disease in London are shown in the tables of admissions to the hospitals of the Metropolitan Asylums Board. In 1913 the number of patients sent from their homes to the fever hospitals on doctors' certificates was 27,746, and of these 2501 were found not to be suffering from the diseases certified. The following table shows the cases in detail :—

[1] *Medical World*, June 16, 1916.

Admissions to Fever Hospitals of the M.A.B.

Disease certified.	Total Admissions direct from Home.	Number not suffering from Disease certified.
Scarlet fever	15,973	963
Diphtheria	6,484	1009
Enteric fever	399	161
Measles	3,603	203
Whooping-cough	1,099	55
Cerebro-spinal fever	20	15
Puerperal fever	68	10
Typhus	5	1
Poliomyelitis	11	0
Smallpox	2	2
Uncertified	82	82
	27,746	2501

It may be noticed that nearly 16 per cent of the cases sent in as diphtheria, and more than 40 per cent of those sent in as enteric were suffering from other maladies. Among the cases wrongly diagnosed as one or other of the notifiable diseases were 927 instances of tonsillitis, 288 of erythema, 152 of German measles, 77 of pneumonia, 70 of laryngitis, 59 of bronchitis, and 230 in which *no obvious disease* could be found on admission. A considerable number of these persons must have been acutely ill, for 111 of them died while in the fever hospitals.

These statistics are for the whole of London, but when we examine the experience of individual hospitals we find considerable variation in the proportion of errors. In admissions for scarlet fever, the percentage of errors was 10·6 at the Eastern Hospital and 1·6 at the Brook Hospital. For the same two hospitals the percentages of errors in admissions for diphtheria were 29·9 and 8·1 respectively. It is difficult to account for these wide local variations, except on the view that the hospitals with the high percentages of errors draw a larger proportion of their patients from the poorer districts, where the doctors devote less time and attention to their patients.

These figures are startling, but it must be remembered

that some cases are very difficult to diagnose, and that in doubtful cases doctors are encouraged to notify rather than to wait until clear indications develop. On the other hand, these are not cases overlooked in the hurry of surgery work, but patients who presumably have been very carefully examined ; the practitioner is under no obligation to notify until he is satisfied of the presence of the disease ; and in doubtful cases the opinion of the Medical Officer of Health can usually be obtained. After making every allowance for difficult cases it is certain that the percentage of errors is much too high. The Medical Superintendent of one of the largest fever hospitals has stated that in at least two-thirds of the cases wrongly diagnosed, the mistake ought never to have been made. The experience of the M.A.B. hospitals for diseases other than infectious fevers shows that when patients are under conditions for efficient examination very few errors need occur. Among the patients in these hospitals 73 cases arose which were diagnosed as infectious fevers and were sent to the fever hospitals, where only one was found to have been wrongly diagnosed. These figures illustrate in striking manner the ineffectiveness of general practice under present conditions.

Speaking of working-class practice, Dr. Newsholme says : " This practice will not be likely to be satisfactory unless patients under its conditions have the same modern facilities for diagnosis as are commonly available for hospital patients." [1] In regard to the special examination of sputum in suspected phthisis he says : " After making full allowance for the varying extent to which practitioners examine sputa for themselves, or have them examined in private laboratories, there can, I think, be no doubt that this aid to the diagnosis of tuberculosis is greatly neglected in a large portion of the country."

The Lack of Laboratories for Special Diagnosis

Most of the larger Local Authorities, including the Metropolitan Borough Councils, now undertake bacteriological examinations in cases of suspected diphtheria and

[1] *Annual Report to Local Government Board* for 1913–14.

enteric fever for practitioners free of charge, and where such facilities are available, the doctor alone is to blame for not making use of them. But these opportunities are not provided everywhere, and facilities for investigations less frequently required, such as examinations of blood, excretions, and new growths, and diagnosis by X-rays, are almost non-existent except on payment of fees. The importance of providing public laboratories for these purposes was frequently mentioned in debates and discussions on the Insurance Act, and it was actually made a condition of the extra-Parliamentary grant for medical benefit that doctors should employ these modern methods of diagnosis; but the Insurance Commissioners have not yet taken any steps to provide the laboratories necessary for the doctors to fulfil their obligations. For the first two years after the passing of the Act no thought seems to have been given to the matter at all; for 1914–15 a sum of £50,000 was voted by Parliament for the purpose, but still no action was taken and the money was not spent; in 1915–16 a sum of £25,000 for pathological laboratories was included in the estimates but was vetoed by Parliament. The provision of facilities for expert diagnosis would not have been a difficult matter. The cost is not high; there are no vested interests to be overcome, and the laboratories of Local Authorities, hospitals, universities, clinical research associations, etc., afford opportunities for making arrangements. It is impossible to find any other reason for the failure to provide these facilities than sheer official lethargy or ignorance of their need. As a nation we are frequently reproached for not sufficiently employing scientific methods, but in this case the fault is not with the people, nor the doctors who have shown the need, nor Parliament, at least up to 1915–16, but with the highly-paid administrators who draw their salaries and neglect their public duties. In a later chapter proposals will be made to decentralise much of our Public Health administration, increasing the powers of Local Authorities and diminishing these of the central departments. Since it is urged against this proposal that Local Authorities are apt to neglect Public Health duties and require 'gingering'

by the central authorities, it is well to bear in mind that the latter are often quite as much in need of this process themselves.

The Futility of Treatment in a Bad Environment

Perhaps the most disheartening feature of medical practice among the working classes is the hopelessness of attempting to produce any permanent and substantial improvement in health under existing conditions of the environment. We can realise this by studying rather more closely the nature of the ailments from which the patients who throng the doctors' surgeries suffer. A large proportion of these, as indeed of all the working classes in large towns, are not suffering from definitely definable diseases, but are in a state of chronic ill-health, which is variously described as 'debility,' 'run down,' 'out-of-sorts,' etc., the result of a life of toil in insanitary surroundings. Another large group suffer from ailments to which more definite names can be given, such as anæmia, dyspepsia, nervous breakdown, varicose veins and ulcerated legs, milder forms of bronchitis, chronic rheumatism, and effects of decayed teeth; uterine displacements in women; and rickets and malnutrition in children; all conditions not in their early stages serious, nor even necessarily incapacitating for work, but sufficient to make life wretched, and to serve as the foundation for graver maladies.

The fact we have to realise is that these people are urgently in need of fresh air, rest, and good feeding, and that medical treatment can do little for them beyond giving temporary relief to symptoms, so long as their surroundings remain unchanged. The practitioner may treat the shop-assistant suffering from varicose veins or ulcers with ointments for months, but only a prolonged period of rest will be of any real benefit. He may prescribe quarts of bismuth and soda mixture for the chronic dyspeptic, but so long as his patient lives on unsound or unsuitable food, or has only a hurried interval for his meals before resuming work, the symptoms will continue. He may prescribe

without result cod-liver oil and Parrish's food for the slum child, whose daily breakfast (and often dinner and tea as well) consists of tea and bread and jam, and he will find grey powder and citric acid useless for the sickly infant needing plenty of good fresh milk. He may vainly dose with phenacetin the woman who is suffering from continual headaches while sewing all day in a hot stuffy room, perhaps with an error of refraction which he could probably neither measure nor prescribe for.[1] Only a change of environment will produce any lasting improvement in the great majority of these patients. The anæmic girl must be taken away from her daily life in the scullery; the woman with the displaced uterus from her charing; the chronic bronchitic from the fog and dust of cities; and the neurasthenic from the noise and turmoil of the street or factory. But the general practitioner possesses no magician's wand to effect these transformations, and he cannot send his patients empty away. Hence he falls back upon medicine as the only procedure which has a semblance of giving help, and all his patients receive their iron and strychnine 'tonic,' pill, or ointment as a wholly inadequate substitute for the real measures their condition demands. As a very able panel practitioner once remarked to the writer at the end of a heavy evening's surgery: "Well, I have prescribed many gallons of medicine to-night, and if I could have given each one of these people a good square meal it would have done them a great deal more good."

The Apotheosis of Drugs

Unfortunately belief in the curative value of drugging is now firmly established in the minds of all classes of the community. This is the result partly of mediæval tradition and partly of the unscrupulous devices of the patent-medicine vendor; but doctors themselves are also

[1] The referees appointed by the Insurance Commissioners to adjudicate on the scope of medical benefit, have decided that testing the eyes for errors of refraction, and prescribing as a result of the test, is not a service which "consistently with the best interests of the patient, can properly be undertaken by a general practitioner of ordinary professional competence and skill."

in a measure responsible. Sir Clifford Allbutt has said: "Physicians resent all that savours of quackery, at any "rate in medicine; yet is there any custom more apt to "engender and to foster quackery than to encourage snobs "to wander round our halls for potions to be hugged to their "bosoms as charms? In not a few cases, it is true, these "herbs and salts have some virtue; but in how many are "they not stock receipts, either wholly futile or at best "impotent as auxiliaries against unwholesome habits and "conditions of life which the physician, unable to "ameliorate, gets weary of denouncing? Too soon he "learns to say to himself, 'Poor creatures, errant or "sinful, God help them, I cannot; yet if pill or potion "be a comfort to them, or a hope, by all means let them "have it.' And the quackery does not end here; "unhappily it permeates into the higher social ranks, to the "degradation of scientific therapeutics." [1]

It is not probable that doctors will relegate drugs to their proper and useful sphere, any more than the sister profession, the Church, will officially abandon beliefs now recognised by educated persons as erroneous; for prescribing is the only element of mystery left in medical treatment. But the result is a wholly exaggerated idea of their value in the public mind. The worst feature of this belief is that it is shared by legislators, and under the Insurance Act something like one and a half millions are provided annually for medicines, while the far more urgent need for specialist services and nursing are entirely neglected, surgical and medical appliances are restricted to the barest minimum, and the extra food for consumptives is rigidly limited. All over the country a large staff of salaried officials are employed in checking prescriptions given by panel doctors, which probably number not less than thirty millions a year, while a sick person has no right to even an occasional visit from a nurse to perform a special service. The amount spent by the community on the purchase of drugs, whether from doctor, chemist, or through the Insurance Act, must be enormous, and the sale of patent medicines

[1] *Hospitals, Medical Science, and Public Health.* An address delivered at the opening of the Medical Department of Victoria University, Manchester, 1908.

has actually increased since the Act came into force, presumably as a result of the general advertisement given by the Government to medicines. How much better would this money be spent in removing some of the conditions which lead to the demand for drugs!

The Discontent with the Panel System

Dissatisfaction with the panel system is widespread. The doctors complain that they are harassed by unnecessary regulations and circulars from administrative authorities; that sick visitors and agents of Approved Societies interfere with their treatment of patients; that their certificates are sometimes overruled; that an excessive amount of clerical work is required from them; and that they are not paid fully and promptly. The non-panel doctors complain that insured persons are not freely permitted to be attended by them. The officials of Approved Societies state that they cannot rely upon the doctors' certificates, and that they do not exercise sufficient care when examining patients. Insured persons complain that they do not get proper and sufficient treatment; that a distinction is made between them and private patients; that sometimes they cannot get a doctor at all; and that sometimes they are made to pay for services to which they are entitled without charge.

There is a large measure of truth in all these complaints, but the fault lies far more with the circumstances and the system than with the doctors who are often working under conditions of exceptional difficulty. The panel system was unsound from the beginning. It was based upon a form of contract practice which had never been ideal, and it worsened rather than improved the previous system. It does not meet the crying need of the working classes for greater hospital treatment. It expects the doctor to perform satisfactory work in the worst environments without giving him assistance from consultants, facilities for skilled diagnosis, or nursing; it does nothing to increase his interest in the scientific side of his profession; and it perpetuates competition between doctors

instead of establishing co-operation. A national medical service at least could not be less satisfactory; but the best solution is probably to be found in giving Local Authorities power to establish municipal medical services with wide latitude as to the form of the service, according to the needs and circumstances of each district.

Medical Treatment of School Children

We have seen that roughly about one-third of the school children in England and Wales undergo a medical examination in the course of the year, and from the number found defective it was estimated that the total number of school children who require medical treatment is more than a million and a half. But detection of a defect by no means assures its treatment. The school doctor who examines the child is precluded from undertaking treatment, and, except in districts where the Education Authorities have made special arrangements, recourse must be had to private practitioners or the Poor Law. Under these conditions it is inevitable that a large number of children should fail to receive treatment. There is no return for the whole country of the number of children who receive treatment, but the following table relating to some 59 school areas, representing a total average attendance of about 754,000 school children, shows how large is the field still to be covered:—

Medical Treatment of School Children [1]

Number of defects needing treatment	131,157
Number of defects treated	74,124
Number of defects not treated	32,375
Number for which no report is available	24,658
Results of treatment—	
Remedied	42,884
Improved	24,915
Unchanged	6,325

It appears therefore that less than 60 per cent of the defects found were treated actually, and only about 33

[1] From the Report of the Chief Medical Officer to the Board of Education for 1914.

per cent were remedied, while a smaller percentage appear under the somewhat elastic title of 'improved.' Since only one-third of the school population comes under medical inspection in the year, and since only one-third of the children found defective on inspection have their defects remedied, it follows that out of the total mass of defectiveness the school medical service is still only correcting one-ninth in the course of the year. And be it remembered that at the best the school medical service only deals with chronically defective children. Except for infectious diseases there is no State provision for the many thousands of children who in serious illness are kept at home. It is obvious that the present system can have only a very limited effect upon the great mass of sickness and defectiveness among school children.

To provide merely for the medical inspection of every school child once a year would entail trebling the present staff; and it may be noted that, since they are not followed by treatment, more than 40 per cent of the inspections are wasted, except for the statistical information they yield.

The failure to provide medical treatment is due partly to parents not appreciating the importance of having their children treated, and partly to their inability to pay doctors' fees in the absence of other facilities. Poor Law medical relief can sometimes be sought, but parents are often reluctant to take this course, and the treatment available may be insufficient. The school medical officer for Shropshire writes :—

"In cases where the parents are unable to afford treatment and cannot get charitable help, one is compelled to suggest application to the Guardians. It cannot be considered that this is satisfactory from any point of view. Parents who have never had poor law relief do not care to apply for treatment of defects in their children which to them often appear trivial. The result in many cases is that the parents deny that any defect exists and refuse to do anything. Nor have the Boards of Guardians any special facilities for the provision of treatment for the defects of the eye, ear, and throat, which form the large

majority of the defects amongst school children requiring treatment." [1]

A welcome development during recent years has been that of school clinics, which now number upwards of 350, and are to be found in nearly all the large towns. The system is steadily growing, but the number of clinics is still far from sufficient to meet the demand, and many of the clinics limit the scope of the treatment they give, some treating minor ailments only, others errors of refraction alone, and others confining themselves to dentistry. Besides establishing school clinics, some Local Authorities have now made arrangements with hospitals for the treatment of school children, and in some districts special institutions have been provided for the treatment of tuberculosis, ringworm, and ophthalmia.

Defectiveness in school children, as most disease elsewhere, is mainly a matter of environment; and the most economical course in the long run is to prevent defective conditions arising by enlarging playgrounds, increasing open-air classes, and similar measures. Nevertheless it would be well worth while to establish a thorough and efficient system of school medical inspection and treatment, for in children medical treatment yields a greater return than in adults. Children can often be permanently benefited by early attention to the throat, ears, eyes, or teeth, whereas in adults often little can be done. Probably the best plan for the community would be to place treatment as well as inspection in the hands of the school doctor, who should be definitely attached to a group of schools, should be a specialist in diseases of children, and should be provided with a properly-equipped centre at which minor operations could be performed. It is no use however disguising the fact that this course would arouse great hostility among a section of general practitioners.[2]

In rural districts we might with advantage adopt the

[1] Quoted in Report of Chief Medical Officer to the Board of Education for 1913.

[2] The following resolution was passed by the British Medical Association in 1914: "Treatment by an education authority should be confined to necessitous children—that is, to those children whose parents cannot afford to pay privately for the treatment recommended as a result of inspection. Parents should always in the first place be recommended to seek treatment for their children from their family doctor.

system of travelling school hospitals which has been very successful in Australia. The unit could consist of a small medical staff, including an oculist and a dentist, and should be properly equipped with the necessary appliances. It would travel about the country from village to village attending the children in need of treatment, and would thus bring a very large number under treatment in the course of the year at comparatively small cost.

An important adjunct to the school medical service is the school nurse. She helps to treat minor ailments and uncleanliness, and is of great service in 'following up' cases recommended for treatment.[1] The Medical Officer to the Board of Education considers that one nurse cannot deal with a school population of more than from 2000 to 3000, an opinion with which those familiar with the condition of school children will thoroughly agree. But in England and Wales as a whole there is still only one nurse to about every 6000 children, counting two part-time nurses as one whole-time. Thus to bring the nursing staff up to even the minimum standard we should have to double the number of nurses at present employed, though this again would be a thoroughly sound and economical step. The money we are now spending on a large staff of insurance prescription checkers would have yielded far greater return if it had been employed in increasing the school nursing service, for the school nurse exerts a direct and immediate influence upon the health of the school child.

Mortality in Child-bed and its Causes

The number of deaths of mothers in England and Wales from pregnancy and child-birth averages about 3500 per annum in roughly 880,000 births, that is one death in about every 250 births. This rate has not varied widely for a considerable number of years, as may be seen from the following table :—

[1] In Sheffield, in 1915, the school nurses made 83,793 examinations of children for the treatment of uncleanliness alone, and many more for other purposes.

Year.	Deaths per 1000 Births.*
1899–1908	4·22
1909	3·70
1910	3·56
1911	3·67
1912	3·78
1913	3·71
1914	3·95

* Exclusive of deaths from puerperal nephritis and albuminuria. Up to 1911 these deaths were not classified as puerperal, and to make the figures comparable they have accordingly been deducted in the rates for 1911 and subsequent years. Their inclusion would raise the figures by about ·25 all through.

It is of course very desirable to prevent this loss of life as far as possible; and the belief that much of it is due to bad surroundings and lack of skilled assistance at birth has led to a strong movement for increasing medical and midwifery services, lying-in homes, maternity benefits, and similar measures. Nevertheless, knowledge of the causation of these deaths is still very imperfect; and in this direction also, as in infant mortality, we seem to have jumped to conclusions without adequate investigation. Until a year ago few persons would have hesitated to say that lack of medical attendance, insanitary surroundings, poverty, and working of pregnant women in factories were potent causes of maternal mortality. But the whole subject has recently been investigated by Dr. Newsholme and his staff, as far as material permits, and their singularly interesting report shows that none of these factors can be regarded as of overwhelming importance.[1]

Let us note first the distribution of maternal mortality. We have seen in previous pages the very marked effect of rural conditions in lowering sickness and disease from practically all causes; but when we turn to deaths in childbed, we are at once struck by the fact that the distinction between rural and urban environments no longer holds good. In the whole of the North of England the death-rate is somewhat higher than in other parts of the country, but there is very little difference between the rates in the aggregate of County Boroughs and of Rural Districts.

[1] "Maternal Mortality in connection with Childbearing and its Relation to Infant Mortality," Supplement to *Forty-fourth Annual Report of the Local Government Board*, 1914–15.

In the Midlands and the South of England the rural rates are slightly higher than the urban rates. The highest rates are found in the Rural Districts of Wales. With this exception, the cause of which is not clear, the range of variation between aggregates of Urban and Rural Districts is everywhere small and does not faintly approach that exhibited by infant mortality. We have for diseases taken for extreme comparison the County Boroughs of the North and the Rural Districts of the South, and for maternal mortality in child-bed the rates for these areas are respectively 4·35 and 3·76 per thousand births for the period 1911–14.

When we examine towns we can find no constant difference between those which exhibit a high and those with a low death-rate. Taking a series of towns in the same county, Lancashire for instance, we find the following variations: Rochdale, 7·21; Burnley, 6·57; Blackburn, 6·55; Liverpool, 3·61; St. Helens, 3·39; and Bootle, 3·08 deaths per thousand births. These statistics are for a period of four years, 1911–14. It is quite possible that if they were compiled for a different four years, the towns would show a different order, or if they were taken over a longer period the differences would disappear. More significant perhaps are the variations in the rates in the Metropolitan Boroughs. The lowest rates were 2·81 in Stepney, 2·62 in Shoreditch, 2·61 in Bethnal Green, 2·33 in Southwark, and 2·06 in Bermondsey. In West Ham the rate was 2·20. The highest rates were 4·73 in Westminster, 4·47 in Hampstead, 4·46 in Stoke Newington, and 3·97 in Chelsea, all districts in which presumably a high proportion of mothers are attended by medical practitioners. It is a singularly interesting fact that the most poverty-stricken districts of London, where the infant mortality is the highest, show the lowest rates of maternal mortality; whereas the wealthier districts which have the lowest infant mortality have also the highest maternal death-rate. It would appear that neither social position nor standard of comfort have any greater effect in reducing the maternal death-rate than they have in reducing the infant mortality rate during the early weeks of life.

Nor can a consistent relationship be traced between excessive mortality from child-birth and a high degree of employment in factories. Textile towns as a whole show some excess, but there are remarkable exceptions. In Nottingham, with 26 per cent of the total married and widowed women engaged in non-domestic occupations, the mortality rate was 3·79 per thousand births; whereas in Halifax, with only 16 per cent of the women so employed, the rate was 6·23. The experience of rural Wales shows that a high rate of maternal mortality can exist where only a few women are engaged in factory work. Unexpected too is the conclusion that maternal mortality from child-bearing appears to be largely independent of general sanitary conditions, some towns with a low standard of general sanitation, such as Bolton and St. Helens, showing as low a rate of maternal mortality as towns with a much higher standard, such as Croydon.

Inability to pay for medical assistance or sufficient food or other necessaries has often been regarded as a cause of maternal deaths, and the primary object of maternity benefit was to meet these deficiencies. But the experience of the poorest quarters of London and various industrial towns does not support this view. Moreover, if poverty had been an appreciable factor we should have expected that maternity benefit, which, where both husband and wife are insured, now provides a sum of £3, would have lowered the death-rate. Maternity benefit is not a provision the effect of which will only become visible after a considerable period, but one which, if it was going to produce any effect at all, would produce it at once. Yet reference to the table on p. 196 will show that the rate has actually risen somewhat during the two years the Act has been in operation. In Scotland during the same period the rate has risen from 5·5 to 6·0 per thousand births.

Finally it may be noted that neither a high nor a low birth-rate appears to have any marked influence upon the rate of maternal mortality; and the same may be said of illegitimacy.

Skilled Attendance in Child-bed

This, the most important question for the purposes of the present chapter, was also investigated by the Local Government Board; and here again the author of the report is unable to come to definite conclusions. In some areas where attendance appears satisfactory the death-rate is high, while in others with inadequate attendance the rate is low. In Newport (Mon.) 74·7 of the total births were attended by midwives, and in 18·4 per cent the midwives obtained additional assistance from doctors, yet the death-rate was 5·28; whereas in Newcastle, though only 28·8 per cent of the births were attended by midwives, with assistance from doctors in 9·3 per cent, the death-rate was 3·89 per thousand births. Dr. Newsholme remarks of the statistics on this point that "they do not themselves justify any general conclusion as to relationship between mortality in child-bearing and attendance in confinement by midwives or doctors. Much more minute local investigation is required in each County and County Borough concerned."

The Pathological Causes of Deaths in Child-bed

It is clear from the foregoing summary that the problem of maternal mortality, so far from being one which is to be solved by the simple provision of more doctors and midwives and maternity benefits, is really highly obscure. If we had accurate information regarding the pathological causes of these deaths, firm conclusions could perhaps be drawn just as was possible with infant mortality, but unfortunately the statistics on this point are scanty and unreliable. General knowledge however shows that the causes of maternal deaths, as those of infants, may be divided into two broad classes, viz. (1) abnormalities in the mother and defects arising during gestation, most of the deaths from which are unavoidable, except perhaps with the most highly skilled attendance, and then only to a limited extent, and (2) accidents or septic infection during or after labour, which must be regarded as almost

entirely preventable. In the latter group puerperal fever is by far the most important and most frequent of the avoidable causes of maternal deaths, and we know that it is almost always due to failure on the part of the doctor or midwife to observe strict antiseptic precautions.

Puerperal Fever.—If we had statistics which showed whether mothers who are attended in child-birth by doctors or midwives suffer less from puerperal fever than those who receive no skilled attendance, or whether the incidence is less among those who are attended by doctors than those attended by midwives, we should have a very fair means of gauging the effect of medical treatment in reducing the death-rate, and of comparing the value of doctor and midwife. Unfortunately the statistics on this point are on the face of them not reliable. Puerperal fever is a notifiable disease, and in towns where there is active municipal midwifery supervision the death-rate ranges between 20 and 40 per cent of the cases notified. Broadly speaking, therefore, notifications should be about three times the number of deaths; yet so negligently is the law observed that in ten County Boroughs and in fifteen Counties the registered deaths from puerperal fever actually exceeded notifications in 1911–14, and in eleven other areas the numbers were equal. There is reason to think that medical practitioners are more lax in notifying puerperal fever than midwives. To a limited extent also the statistics are made unreliable by the differences of meaning attached to the words 'puerperal fever' by different medical men. The term is really an obsolete one, dating from the time when the condition was believed to be a definite disease, but, unless understood to mean all puerperal septic infections, it ought now to be abandoned.

General Practitioner or Midwife?

But while we cannot be dogmatic, we cannot ignore certain indications which appear to point to doctors being more responsible for puerperal fever than midwives. Sir Halliday Croom, after referring to the great reduction in mortality from puerperal fever in lying-in hospitals, says:

But while these wonderful results have taken place in hospitals, mark you, the same has not been the case in out-door practice. There the disease still persists, and the death-rate from blood-poisoning in private practice still remains very high. Why is it so? Because while in maternity hospitals the nurses and doctors are under discipline, and the antiseptic regulations are carried out under pain of dismissal, such does not apply to private practice where nurses and doctors do as they please. They are taught in the maternity hospital the strict and careful use of antiseptics, but unfortunately both the attendants become less scrupulously careful. . . . I should like to ask you to look for a moment not only at the mortality, but at the morbidity—by that I mean the ill-health induced by perfunctory and inaccurate midwifery, . . . the amount of ill-health which is induced by unskilful midwifery is endless. . . . Among the poorer classes women remain permanently disabled and handicapped for the rest of their lives.[1]

It should be pointed out that in so far as Sir Halliday Croom's remarks relate to midwives they do not apply to England and Wales, where the Midwives Act has been in force since 1905, nor do they now apply to Scotland.

Dr. George Geddes has made an exhaustive investigation of puerperal sepsis in Lancashire, and he finds that at least midwives are not more responsible for causing puerperal fever than are doctors, while some of his statistics show that they are far less so. In the residential town of Blackpool, for instance, the puerperal rate among women attended by midwives was 2·4, and among those attended by doctors it was 4·8; in the mining town of St. Helens the midwives' rate was 1·7, while the doctors' rate was 13·2. Dr. Geddes attributes the excess among doctors in mining districts largely to the fact that they are so frequently dressing small septic injuries from which they go straight to their maternity cases.[2]

In studying the relative advantage of doctor or midwife it is important to bear in mind that child-birth is not sickness but a natural process; and there is good reason to believe that the great majority of mothers, in the absence of medical attendance, would go through their

[1] Address delivered at a conference of Delegates of Approved Societies, Edinburgh, 1915, on the invitation of the National Health Insurance Commission (Scotland).

[2] *Etiology and Distribution of Puerperal Sepsis*, 1913.

confinements safely without further assistance than that of some one sufficiently skilled to perform certain necessary but simple services as soon as the child is born. In by far the larger number of cases the ideal treatment is to do little beyond encouraging the mother and relieving symptoms of discomfort. This course may somewhat prolong labour, but in the long run it is the best for both mother and infant, the absence of intimate examination or use of instruments enormously diminishing the risk of puerperal fever. Midwives are severely restricted in the methods of this nature which they may employ. But it will be objected that, while this is quite true, the presence of a doctor is important in order that he may do what is necessary in the exceptional complicated case. In theory this is so, and if doctors always adopted the expectant attitude, and only interfered when occasion really demanded, no criticism could be made. Unfortunately it is well known that in working-class practice, and even to some extent in better-class practice, this is far from being the case. The fees paid for attendance in confinement are disproportionate to the time which the case demands if properly dealt with ; and the doctor may have a long list of patients to see, or may be anxious to get back for his consultation hours. He is consequently under strong temptation to cut short the case by applying the forceps at the earliest possible moment ; the instruments are often not properly sterilised —indeed in the homes of the poor it may be impossible to do this—and the risk of puerperal fever to the mother and of injury to the infant is greatly increased. It is notorious that this course is adopted in a considerable number of uncomplicated cases which if left to themselves would terminate naturally. The custom among doctors in the poorer quarters of certain towns of leaving the earlier conduct of a case to an unregistered midwife and rushing in towards the end to finish it off—almost amounting to ' covering '—has grown to such an extent that the General Medical Council has recently found it necessary to issue a special warning on the subject. This may happen in a case where a doctor has been engaged to attend. When a midwife has charge of the case she is

required to summon a practitioner in certain eventualities, the doctor's fee being paid by the Board of Guardians, or in some districts by the Local Authority; and if the case is one which 'requires the use of instruments,' the doctor receives an additional fee. Some of these cases demand the highest skill of a gynæcologist, but the general practitioner cannot have, and does not profess to have, this degree of skill. Undoubtedly he saves life in some instances, but we must look at the matter as a whole, and unfortunately there is no doubt that in working-class practice a considerable amount of harm is done by hasty, unnecessary, or unskilled interference. The harm is not represented only by deaths. A much larger number of women suffer permanent ill-health or discomfort from injuries received or sickness caused.[1]

We have noticed the exceptionally low rates of maternal mortality in the poorest districts of London, and at first sight it might appear that this is inconsistent with the foregoing remarks. But it must be remembered that a large proportion of the mothers in these districts are attended by students from the medical schools, who are taught to allow full time for natural delivery, and that if instrumental interference becomes necessary it will only be done by, or under the immediate supervision of, the skilled resident accoucheur of the hospital specially summoned for the purpose. Dr. Newsholme considers that this is the most probable explanation of the low rates of maternal mortality in these districts.

We do not know why mortality from child-birth has risen during recent years; and it is possible that the increase is only an accidental fluctuation. We know that

[1] Dr. Drummond Maxwell, of the London Hospital, writes: "There are admitted into the London Hospital a considerable number of cases in which the lower genital tract, cervix, vagina, and perineum are lacerated and bruised to an almost inconceivable extent. One would almost infer from inspection of these cases that the accoucheur had set out to inflict deliberately the maximum injury consistent with survival and been thoroughly successful in his aim. . . . I am bound to say that I do not find the notable improvement that might be expected to follow the better teaching in recent years of clinical obstetrics, and I expect one will have to wait a few years longer before that teaching bears fruit. Certainly the number of mutilated cases one sees is most disheartening, and constitutes a grave indictment against much of the midwifery of the present time."—*The Practitioner*, February 1916.

since the passing of the Insurance Act some busy doctors have given up attending confinements, and that a much larger number of women are now in a position to pay for attendance by a doctor, but we have no means of determining whether a larger or smaller proportion of births are now attended by doctors than before the Act. It is however disquieting to find that, comparing 1914 with 1912, the increase in maternal mortality has been chiefly in puerperal fever, and that it has occurred in London and the County Boroughs; the rate in the smaller Urban Districts having remained constant, while that in the Rural Districts has actually fallen to a small extent.

Attendance in Confinement and Infant Mortality

We have already examined this question in an earlier chapter, and found no reason to believe that attendance in confinement by doctors has any appreciable effect in reducing infant mortality. One additional point is all which needs mention here. Deaths certified as due to 'injury at birth' have been steadily increasing for a number of years. In 1900, with 927,062 births in England and Wales, the deaths of infants from this cause were 448; in 1914, with 879,096 births, the number was 1051. The rates for 1913 and 1914 show larger increases than any previous years. It is possible that these figures are an indication of the steadily-increasing use of forceps.

Maternity Benefit

Since maternity benefit has failed to reduce mortality among mothers, must it then be regarded as a useless waste of money? We will answer this question by quoting from an investigation made by Miss Margaret Bondfield the two following instances of the deplorable conditions under which women may be confined:—[1]

Mrs. D. Husband a hawker of sawdust. Woman was confined in a cellar, where rats ran about the floor. The door, about ½ foot from the steps, let all the wind and rain into the place—a

[1] "The National Care of Maternity," *New Statesman*, May 16, 1914.

most horrible place. A maternity nurse appealed to a Ladies' Charity, but no help came till two days after the confinement. No maternity benefit.

Mrs. F. Husband a casual labourer—deposit contributor—now out of work. Had only 2s. to draw. Two rooms only. Four girls sleep in one small bed in back room; boys sleep in parents' room. No maternity benefit.

Maternity benefit is, in fact, an exceedingly valuable provision for helping mothers through a period of stress. Complaints have been made that the money is wrongly expended by mothers, and it has been urged that the money should be taken out of their hands and expended more judiciously for them by others, which means in accordance with orthodox views. But we cannot separate one need from another at such a time, and the mother alone knows what is most urgently required. Whether the money is spent in paying rent, or providing clothes for the other children, or food for the family, or taking household articles out of pawn, it is none the less serving a very useful purpose. Many mothers have employed part of the money in obtaining extra assistance in the household, and those who know the poor, appreciate what a boon it is for a mother who is laid up to be able to get some one in to look after the home, keep the children clean, and send them to school. If we measure the advantage of maternity benefit by the statistics of maternal or infant mortality, we shall meet with nothing but disappointment; but if we regard the provision as a means of increasing the mother's comfort when most needed, we shall realise what a great blessing it has been to many thousands of poor mothers.

The Question of a Public Maternity Service

Proposals have been made for establishing a National or Municipal Maternity Service, gynæcologists being appointed to attend mothers in confinements, and lying-in homes provided at the cost of the State. This would be a useful step in towns where the number of births is sufficient to render it economically sound. In rural districts efforts must be mainly directed towards increasing and improving

the service of midwives. Be it noted however that a maternity service—*i.e.* apart from maternity benefit—is by no means our most pressing want. If it be assumed that a death-rate of, say, 2 per thousand is unavoidable, we should only save 1750 lives in the course of the year, and this only when we had covered the whole country with the service, necessarily at very great cost. Much as this is desirable, we are bound to recognise that the same amount of money spent in other directions, for instance on a school medical service, would yield a far greater return from the Public Health point of view. In any case it is clear that before any further large scheme of public assistance is contemplated, a thorough and detailed investigation of the whole subject is required.

Medical Treatment and Public Health

We may conclude this chapter by examining the general influence of medical treatment in reducing the death-rate and prolonging the average duration of life, particularly in view of the proposals now made for establishing a national medical service. The first step is to recognise the real services which a doctor renders in the social scheme. To the individual these services are immense and varied. The doctor relieves anxiety of parents and relatives, he does much to increase the comfort of his patient, alleviates symptoms, assuages pain, cheers and encourages. If it be held that these advantages alone justify medical treatment being placed within the reach of every one, then the case for a national medical service is strong. On the other hand, if we look at the question exclusively from the point of view of Public Health, we must not make the mistake—as there is distinct tendency to do nowadays—of supposing that medical treatment has a large effect in preventing sickness or in reducing the death-rate, that is, medical treatment in the limited sense of treatment by a doctor, and not as including surgery, nursing, etc. We have already noticed the uselessness of much medical treatment of minor ailments under existing conditions. When we examine more serious illness which keeps the

patient in bed, we find again that the great service of the physician is to relieve and comfort. It is the rest in bed, care, and nursing which effect the cure of bronchitis, pneumonia, and many other acute illnesses; medicine is almost useless in tuberculosis; medical treatment of cancer is summed up in the word 'morphia.' If doctors are necessary to maintain health or prevent disease we should not find the healthiest conditions in some districts where the doctors are fewest, and the worst in others where they are relatively numerous. Connaught has the lowest death-rate—13·6—of the four provinces of Ireland, yet 47·7 per cent of all deaths were not certified in 1914, *i.e.* the persons were not attended even in their last illness by doctors. Leinster has the highest death-rate, 17·7, yet only 14·7 per cent of the deaths were uncertified. Mr. Walter Long has stated recently that during 1915 Public Health in England has been highly satisfactory, yet a large proportion of the doctors have been withdrawn from the civil population for special military service. This is not to under-estimate the value of medical treatment, but to recognise the real nature of its services. The doctor is not a Public Health officer and never will be; his duties are those of alleviator and counsellor.

On the other hand, a very different view may be taken of modern surgery, which is undoubtedly the means of saving many thousands of lives every year. There is scarcely an organ of the body which is not now accessible to the surgeon, and there is scarcely a disease which, in some manifestation or other, is not benefited by surgical treatment. Cancer in accessible parts can be completely removed, and in women suffering from cancer of the breast or uterus a high proportion of cures is effected, while in other cases life is prolonged. Surgical treatment is appropriate in many cases of tuberculosis, from removal of glands in children to treatment of serious affections of joints. Abdominal surgery in appendicitis, acute obstructions, ulceration, etc., saves many lives which a generation ago would certainly have been lost, while various conditions of the lung-cavities, the kidneys, the throat, and other organs are cured or relieved by surgical treatment. Among

women removal of non-malignant tumours of the uterus is exceedingly common, and removal of diseased ovaries is effected every day in our large hospitals, though when the operation was first introduced the coroners threatened Lawson Tait with holding inquests on his non-successful cases. Even where surgery has not for its immediate object the saving of life, it may undoubtedly do this by increasing the health of the patient. The large number of operations for adenoids in children cannot have been without a substantial effect in improving health in later years. To the surgical treatment of disease must be added that of injuries. Grave conditions, such as fracture of the skull and injuries to important organs, can frequently be treated successfully, while antiseptic measures have substantially reduced blood-poisoning in all forms of injury and wounds. The grave septic infections, such as 'phagedena' and 'hospital gangrene,' are now practically unknown, and many students go through their whole training without ever seeing a case. Nor are the advantages of surgery limited to saving life, for injuries, diseases, and deformities of limbs and joints can now often be treated in such a way as to restore the normal functions.

There can be no doubt that the development of surgery has had a very appreciable effect in reducing the death-rate and increasing the average age. We have already noticed the great increase in the volume of institutional treatment in this country; and *pari passu* there has been a steady decline in the death-rate. As Dr. Newsholme has pointed out, this represents an immense change in the conditions under which disease is treated in this country. If we could pursue the matter further, we should almost certainly find that the surgical wards have had a far larger share in producing this result than the medical wards. Surgery has perhaps been the greatest factor in the decline of the death-rate, which has fallen about 4 per thousand since the period 1881–85. If surgery is only saving in each year two lives more in every thousand people than it did thirty years ago, half the total fall is accounted for. When we add to these the effect of natural decline of disease, we see how grossly exaggerated are the bombastic claims of those who

would attribute all improvement in Public Health to sanitary services. It may be noted that surgeons themselves have been singularly modest in calling attention to the importance of their work in Public Health.

If we are to establish any form of a public medical service we must emphatically begin by providing surgical and institutional treatment. Such a service would not be so difficult to create as was the panel service, for it would not involve interfering with vested interests. Moreover, the question of free choice of doctor would not arise, for the personal relation between doctor and patient, rightly insisted upon under the Insurance Act having regard to the real nature of the services the practitioner renders, need not exist in the case of the surgeon to whom in hospital the patient freely trusts his life, though he may never have seen him before. A mere extension of the panel system, or of any other system on similar lines, would be one of the most profitless steps we could take.

CHAPTER VII

PUBLIC HEALTH AND THE NATIONAL INSURANCE ACT

The Insurance Act a Public Health measure—The German origin of the Insurance Act—The principles of administration of the Act—Local administration—Medical benefit—The supply of drugs—Sanatorium benefit—Sickness benefit—The Insurance Act and insanitary conditions—The Insurance Act and the advancement of Public Health knowledge.

The Insurance Act a Public Health Measure

The National Insurance Act is the most ambitious piece of Public Health legislation ever carried through in this country. No previous measure has directly affected so large a number of persons, involved so great a cost, made such demands upon administration, or been introduced with such lavish promises of benefit to follow; and no previous measure has ever failed so signally in its primary object. In preceding chapters the operation of maternity, and to some extent medical benefit, have been considered, and we have now to examine the other leading provisions of the Act mainly for the lessons which can be derived from them, and for the light they throw upon the weak points in our present system of dealing with Public Health affairs. Probably the greatest obstacle to the development of a sound and comprehensive scheme for protecting the health of the community has been the failure of legislators to appreciate the complexities and difficulties of the questions with which they were dealing. Public Health is a science which demands years of study for its understanding; many of its problems are obscure, and often the seemingly apparent remedies for its defects may be more harmful than beneficial. Health legislation in Parliament has

always suffered from the almost complete absence of scientific medical criticism, and the Insurance Act was no exception to this rule. In its genesis, in its modifications in the House of Commons, and very largely in its subsequent administration, it has been the work of amateurs, and it contains in consequence the most glaring blunders.

The main object of the Insurance Act was to improve the health of the working part of the community, and by its results in this direction the Act must be judged. If it has not improved the Public Health, or has not improved it relatively to its cost, then the Act has failed in its most important object. It is necessary to insist upon this point, for though there is much discussion of the financial position of approved societies, the scope of medical benefit, and other questions, the fundamental purpose of the Act seems in danger of being lost sight of.

It is probable that the National Insurance Act was indirectly the outcome of the Report of the Royal Commission on the Poor Laws, that painstaking and exhaustive inquiry to the recommendations of which so little effect has been given. Both the Majority and Minority Reports called attention to the association of poverty with sickness, but neither recommended national insurance as a remedy, nor took the view that poverty was the main cause of ill-health. The authors of the Insurance Act seem to have believed however that the relation between poverty and sickness is much closer than is really the case. They do not appear to have realised that poverty—short of absolute destitution and consequent starvation—exercises hostile influence mainly by compelling a person to live in an unhealthy environment, and that it is quite possible to be extremely poor and extremely healthy. They ignored, or did not know, that the most poorly-paid section of the working classes, the agricultural labourers, are also the healthiest, and they seem to have come to the conclusion that the payment of a small sum weekly during sickness, while doing practically nothing to improve the environment, would have a great effect in improving the national health. This belief gave the Insurance Act its

essential character, which is that of a palliative rather than a preventive measure, and in this respect made it a reversal of nearly all earlier Public Health legislation. There is scarcely a remedial provision of the Act which comes into force before sickness or disablement is actually present, and the few clauses which were intended to deal with the environmental causes of sickness have, in practice, proved inapplicable.

The German Origin of the Insurance Act

The proposal to establish national insurance in this country was not preceded by a public inquiry of any sort. There was no Royal Commission or Departmental Committee to investigate the value of national insurance, nor was any public report or opinion obtained from the General Medical Council, the Royal College of Surgeons, the Royal College of Physicians, the Society of Medical Officers of Health, or other bodies concerned with Public Health questions. Since the partial inquiry by the Inter-Departmental Committee on Physical Degeneration in 1904, there had been no general investigation into the state of Public Health in this country, nor into the best means of preventing sickness. It is significant of the want of consideration on the most fundamental points that *after* passing a gigantic Act for the prevention and cure of sickness, the Government found it necessary to appoint a Committee to inquire into the causes of excessive sickness chiefly among women ; a little later it appointed a Royal Commission to inquire into the extent and means of preventing venereal disease in the community ; and still later it instituted an investigation into the adequacy of the hospital service in this country. Succeeding years will probably witness public inquiries into many other points concerning national health, all of which should have been investigated before any comprehensive scheme of dealing with sickness was adopted. It is only necessary to look at the list of Royal Commissions and Departmental Committees in recent years in order to see that on many matters of far less sweeping importance, public inquiries have preceded legislative or

administrative action. There is little doubt that if a Royal Commission had been appointed to inquire into the state of Public Health and the steps necessary to improve it, a very different measure would have been introduced, possibly without including national insurance at all.

As far as public knowledge goes, Mr. Lloyd George must be regarded as the originator of the main principles of the Insurance Act; and it is necessary to consider the significance of this fact in relation to our present methods of dealing with Public Health matters. We have no Ministry of Public Health, and no machinery by which Bills relating to Public Health can be submitted to expert opinion before their introduction into Parliament. Consequently measures involving highly scientific questions are introduced by persons who are quite without previous training or experience in Public Health work. We may indeed be grateful to Mr. Lloyd George for the eminent services he has rendered to the country in other directions, and the adverse criticism of his efforts in Public Health, which must again and again be made in this chapter, reflect much more upon the system, for which Parliament is primarily responsible, than upon him personally. When Mr. Lloyd George introduced the Insurance Bill he had not held any of the offices which would have brought him in touch with Public Health affairs. He had been President of the Board of Trade, and was still Chancellor of the Exchequer; but he had not been President of the Local Government Board, which is our nearest approach to a Ministry of Health, nor Secretary to the Board of Education, an appointment which might at least have familiarised him with conditions of health among children. Nor, so far as is publicly known, had he made any special study of Public Health questions or had other experience which would have entitled him to be regarded as an expert. Yet he has constantly expressed opinions upon the most erudite questions with a dogmatism which must astound many a Medical Officer of Health.

But it is perhaps not quite accurate to say that no special investigation preceded the Insurance Act, for Mr.

Lloyd George appears to have been strongly impressed by the national insurance scheme in Germany, and it is understood that during 1910 he spent some weeks in that country studying the system. At that time we were obsessed by belief in German science, forethought, and organisation, and it would be unfair to condemn imitation of German methods merely because our views of the German national character have since undergone a radical change. But the German system could have been condemned at that time and on its merits. Mr. Lloyd George's investigation must have been very superficial, for closer study of conditions in Germany would have shown that in that country national insurance, from the Public Health point of view, had been a failure just as great as it has since proved in our own. Germany has had a comprehensive system of national insurance since 1884, the benefits of which have extended to large groups of dependents, non-working women, and children; nevertheless, the general death-rate, though it has fallen during recent years, has always been about 20 per cent higher than that of England and Wales, and this in spite of the fact that the average age of the population is appreciably less than that of the population of Great Britain. After many years of sanatorium treatment the death-rate from tuberculosis in Germany was 50 per cent higher than in this country where no special efforts had been made. Yet when introducing the Bill, Mr. Lloyd George said: "In Germany they have done great things in this respect. They have established a chain of sanatoria all over the country, and the results are amazing. The number of cures that are effected is very large."[1] We adopted national insurance on the faith of statements such as these, and are now realising our mistake. Yet the merest glance at the German vital statistics would have shown that Germany is the very last country from which we can learn lessons in Public Health or Preventive Medicine. Not only is the general death-rate high, and the death-rate from tuberculosis excessive, but the infant mortality rate has always been very high, and between 1901 and 1910 the deaths of infants under one year of age

[1] Parliamentary Debates, May 4, 1911.

averaged 187 per thousand births. Bad as is the British record, it does not approach these appalling figures.[1] Other countries which have adopted some form of compulsory insurance against sickness are Austria, Hungary, and Russia, and in none of them does the state of Public Health provide any testimony of the value of this principle. France is almost certainly the country of Europe in which the highest standard of general sanitation and healthy living prevails, and it would have afforded a much better model, but our Public Health authorities appear to have devoted little attention to its conditions. English travellers in France are accustomed to be somewhat scornful because they may find sanitary arrangements in hotels not quite so good as those in England; but any disadvantages in this respect, or in the water-supply, are far outweighed by the higher standard of housing, the comparative absence of

[1] It deserves to be noted that the soundest criticisms of the proposal to introduce the German insurance scheme into this country were made by Mr. E. Lesser, representing the Apprenticeship and Skilled Employment Association at the National Conference on the Prevention of Destitution, May 30–June 2, 1911. He said, to quote the Report of the proceedings: "Lest they should take too optimistic a view of what the future of England was going to be when we had got the National Insurance scheme at work, he would like to call their attention to some figures from Germany, where, as they knew, a sickness insurance scheme had been in existence for twenty-five years, and invalidity for about twenty years. While admitting to the full the beneficial results which had been obtained in Germany from the operations of those two schemes, it was none the less somewhat significant that he was able to give them the following figures. Taking the death-rate in the German Empire per 1000 he found it was in 1908 as high as 18, whereas in England and Wales it was only 14·7; in Scotland it was 16·1; in Ireland 17·6. If they took the infantile mortality statistics this country compared most favourably. In the German Empire the death-rate of children under one year of age was 17·8 per cent; in England and Wales it was only 12·1; and in Scotland it was only 11; and in Ireland it was only 9·7. Then they came to other statistics as regarded mortality from certain diseases—diphtheria, measles, scarlet fever, tuberculosis of the lungs—and in respect of all those diseases our figures were far better than those of Germany. In tuberculosis of the lungs the death-rate per 100,000 inhabitants in Germany was 159·2, whereas in England it was only 111·7. In diphtheria the figures for Germany were 22·9, whereas the English figure was only 16·7. What did these figures show? He thought they were entitled to say that they showed that thanks to our very efficient public health service, we had been enabled to keep ahead of Germany as regarded the health of the people without their elaborate insurance scheme. The point he wanted to make was that the money which we had been spending on improving the health of the people, on improving housing accommodation, and sanitation, and such like things, had been really preventive work because it had indirectly helped the people to live under more healthy conditions, and therefore become less likely to fall victims to sickness. To come to the Government insurance scheme, they were really beginning at the wrong end in launching a scheme of this kind. In his opinion they would be investing the money to better purposes if they set to build up a healthier race of children than they were now getting instead of spending large sums in seeking to cure the unhealthy and the unsound."

slums, and the splendid open spaces which characterise so many of the cities of France.

In support of his proposals Mr. Lloyd George issued from the Treasury a " Memorandum of Opinions of various Authorities in Germany " from " leading companies and firms in the more important German industries." These opinions, the writers of only two of which are named, consist of paragraphs written in perfectly general terms all extolling the benefits of the Insurance Laws. We are informed that they " have undoubtedly had a good influence on the position of the working-man " ; that, " on the whole England would do well to adopt similar institutions to those which have for years been a blessing to the German working classes " ; that " the Insurance Laws, together with the increase of wages, have exercised an enormously beneficent influence on the health, the standard of life, and the efficiency of the working classes " ; and that the Insurance Legislation has relieved the Poor Law to a degree that cannot be mistaken." The paragraphs obviously express only the employers' point of view, but there is one naïve opinion which gives a glimpse of other views. The President of ' one of the largest Associations of Employers in the iron and steel industry ' writes : " That the " workpeople themselves are contented is not maintained. " Even were the benefits under the Insurance Laws greater " than they are, and granted at the employers' expense, " there would be no permanent satisfaction of the work- " people's wishes ; but the reason for this lies in human " nature and not in the laws." The conception that human nature should adapt itself to law, rather than that law should be made to conform to human nature is perhaps characteristic of Germany, and may be suited to the amenable people of that country ; but it has always proved a bad foundation for social legislation in England, and the Insurance Act has again exemplified the fact.

This collection of opinions is not a scientific report. It presents only one side of the case ; it gives no statistics showing the sickness rates in Germany before and after the adoption of national insurance ; it contains no opinions from Public Health authorities and no argu-

ment or statement which carries the smallest scientific weight. Regarded as a presentation of the advantages of national insurance in Germany it is entirely unconvincing and inadequate; yet it was the sole evidence of this kind which was placed by the Government before the country previous to the passing of an Act which was to apply compulsion to one-third of the population, and cost many millions annually.[1]

An important difference in the objects of the two schemes should be noticed here. In Germany the insurance system is also a form of Poor Relief, and provides for necessities which are more or less covered in this country by the Poor Laws and the Old Age Pension Act. For example the Societies are required to provide death-benefit, old-age pensions, and, under certain conditions, pensions for the widow and children of a deceased insured person, while the hospitals undertake the treatment of many persons, who, in this country, would be admitted to the Poor Law infirmaries.[2] This aspect of German insurance is repeatedly referred to in the collection of opinions cited above. In the British insurance scheme all suggestion of Poor Law Relief was rigidly excluded, as shown by the prohibition of the use of Poor Law institutions for the treatment of tuberculosis and other diseases. Hence the success or failure of the two systems cannot be measured by the same test. One is designed chiefly for the prevention and cure of sickness, the other is in addition admittedly a form of Poor Relief.

But while the general principle of the British Insurance Act was taken from Germany, substantial modifications were introduced in the details, and unfortunately some of the best features were omitted, while some of the least satisfactory provisions were adopted. Perhaps the best feature of the German system is the excellence and completeness of the arrangements for higher medical treatment, medical benefit providing treatment at hospitals, sanatoria,

[1] The *Memorandum on Sickness and Invalidity Insurance in Germany* issued in 1911 merely sets out the differences in the British and German schemes. It contains no examination of the advantages believed to have resulted from compulsory insurance in Germany.

[2] For further details see *Medical Benefit in Germany and Denmark*, I. C. Gibbon, 1912.

convalescent homes, and forest resorts, treatment by specialists for affections of the eye, ear, etc., nursing, baths, electric treatment, milk, wine, etc., and medical and surgical requisites. Instead of taking this system as a model, we in this country have limited medical treatment to the barest possible minimum. On the other hand we took over from Germany the panel system of providing treatment through medical practitioners, although it had for years led to strife in that country between insurance societies and the doctors with strikes or threatenings of strikes by the latter, and had been shown to lead to malingering and other evils which have now become apparent here.

Thus the Insurance Bill was introduced without any previous inquiry as to its need or probable effects in this country, without adequate investigation of the results of national insurance in other countries, and without the proposals having been before the country. The central principle was taken from a people who for many years had been well drilled and were accustomed to organisation, and was applied to a nation which, to say the least, is impatient of official control; and the best features of the foreign scheme were not copied. The Bill originated with a Minister who had no expert knowledge of Public Health; its value in preventing sickness was assumed without proof on the basis of vague generalities; and promises of benefit to follow were made which scientific investigation would have shown to be unrealisable. We may anticipate here the proposals which will be put forward in detail in a later chapter, and urge that this experience provides the strongest argument for the establishment of a ministry of Health, from which alone Government measures connected with Public Health shall originate, after they have been subjected to close examination and investigation by those who have specially studied the problems involved.

In its passage through Parliament the Insurance Bill underwent many changes, some of which were of a distinctly retrograde character, but it will be more convenient to indicate these when examining the provisions in detail. Again the absence of expert criticism was felt, and many

matters of the greatest importance were neglected, while other proposals were discussed in detail which could at the time have been shown to be unsound and have subsequently in practice proved unworkable.

The Principles of Administration of the Act

The Insurance Act, as it left Parliament, contained many unsatisfactory features; nevertheless its very vagueness and incompleteness afforded opportunity for public benefit, for in no previous Act had such great powers been given to the authorities charged with administration, and so many decisions of importance been left to their discretion. They were empowered to issue Regulations, which have all the force of law after they have been laid before both Houses of Parliament, and an address has not been presented to His Majesty, within twenty-one days, praying for their annulment; thus making the Commissioners to a considerable extent a legislative body.[1] In case this should not be sufficient, they were, for the purpose of overcoming initial difficulties, given powers of suspension and alteration of the law unprecedented in any Act of Parliament. Clause 78 of the Act provides that—

> If any difficulty arises with respect to the constitution of Insurance Committees or the advisory committee *or otherwise* in bringing into operation this part of this Act, the Insurance Commissioners, with the consent of the Treasury, may by order make any appointment and *do anything which appears to them necessary or expedient* for the establishment of such committees or for bringing this part of this Act into operation, and any such order may modify the provisions of this Act so far as may appear necessary or expedient for carrying the order into effect. Provided that the Insurance Commissioners shall not exercise the powers conferred by this section after the first day of January nineteen hundred and fourteen.

[1] In 1915 the Scottish Insurance Commissioners proposed to institute a uniform and comprehensive audit and issued Regulations for the purpose. When they were on the point of laying these before Parliament the Insurance Committee of the Burgh of Glasgow applied for an interdict on the ground that the proposed Regulations were *ultra vires* and an invasion of the statutory functions and right of independent action of the Committee. The Court held that they had no jurisdiction to entertain any questions as to the validity of the Regulations and dismissed the application.

With these enormous powers even a badly-drafted Act could have been made to yield good results if ably administered; but few will maintain that the Commissioners have, as a matter of fact, taken advantage of the extensive powers and opportunities given to them. The administration has been allowed to assume a degree of complexity which baffles comprehension; the medical service is notoriously inadequate and inefficient, while the Public Health aspects of the Act have been almost lost sight of. Doctors, chemists, insured persons, and society officials are all alike dissatisfied. On the other hand, in fairness to the Commissioners it must be pointed out that a principle was observed in their selection which must have hampered collective action from the beginning; and this point demands further examination.

During the passage of the Insurance Bill through Parliament various bodies with more or less divergent vested interests became alarmed lest their rights and privileges should be interfered with, and much heated discussion arose. The doctors were afraid of too much official control and too little remuneration; the Friendly Societies were anxious to protect the position of their members; the commercial insurance companies demanded admission into the scheme; and representatives of women's organisations concerned themselves with women's interests. Some attempt was made in the Act to unite these various interests, but Parliament left its work in this direction unfinished, and assigned it to the Commissioners to complete. For this purpose a principle was adopted in the selection of the Commissioners which, if not new, had certainly never been followed to the same extent previously, viz. the representation of specific interests in the administrative authority itself. The Medical Secretary of the British Medical Association, a body which had vigorously defended the interests of medical practitioners, was appointed Deputy Chairman of the English Commission; another Commissioner represented the Insurance Companies; another the Friendly Societies; another who had been prominently associated with the interests of labour may be taken to represent the insured persons; and another

represented women's interests. The remaining members were the Chairman, who had had a long and distinguished association with educational matters, and had been Permanent Secretary to the Board of Education; another who had also been connected with the Board of Education; the Chief Registrar of Friendly Societies who is *ex officio* a member of the Commission; and a representative of the Treasury. No objection could be taken to the composition of this body from the point of view of reconciling or representing the divergent interests concerned, but it is important to note that the course adopted involved sacrificing any idea of making the Commission authoritative in Public Health questions. Not one of the members, however eminent in other directions, would claim to have had any special experience in Public Health administration, or special knowledge of its more scientific problems; yet they were called upon to administer an Act which touched Public Health questions in every direction, and one which, so far from providing a fully-worked-out scheme, left to the discretion of the Commissioners many matters of the greatest importance.

It is not surprising that under these circumstances the Commissioners have never regarded themselves as forming a Public Health authority. This is clear from their administrative actions and public utterances. They have devoted their energies mainly to creating the machinery for enforcing insurance; they have been satisfied with mere names, as for instance "domiciliary benefit" in place of an efficient system of treating tuberculosis; and they have neglected almost entirely (as we shall see when examining them in detail) those provisions of the Act which demanded scientific knowledge or were of a preventive character. We may note in the difference between the reports issued by the Insurance Commissioners and those published by the Local Government Board and Board of Education, the view which the Commissioners take of their functions. The Local Government Board and the Board of Education each issues a special report by its Chief Medical Officer which is not limited to administrative details, but discusses the work of the Department in relation to Public Health.

The influence of that work in reducing sickness or mortality is pointed out; information is given as to what has been done, and what it is intended to do; local opinions are quoted, and suggestions are made for improving the services with which the Department is concerned. Besides the annual medical report, special reports on scientific and Public Health questions are issued from time to time, particularly by the Local Government Board. The Insurance Commission has also a Chief Medical Officer, but he issues no medical report, and the annual report published by the Commissioners contains only a record of official transactions and administrative steps. As far as official sources of information are concerned, the public has been left entirely in the dark regarding the influence the National Insurance Act has had on the health of the people. No statistics relating to the health of insured persons have been issued by the Commissioners; no steps have been taken to provide Insurance Committees with suggestions or schedules of lectures on Public Health; and no leaflets have been issued on the care of health. In America the larger Life Insurance Companies have found it profitable to distribute pamphlets to their members on such subjects as the health of the worker, consumption, open-air living, housing, health of children, recreation, etc. But though the Commissioners have issued many hundreds of circulars, orders, and memoranda, not one of these has, up to the present, borne directly upon the fundamental objects of the Act, viz. the prevention and cure of sickness.

Local Administration

In local administration also the Insurance Act has fared badly from the Public Health point of view. The Bill, as originally introduced, contained the sound proposal for the establishment in each county and county borough of a "Local Health Committee." This body was charged with the administration of medical benefit for deposit contributors, and of sanatorium benefit for all persons entitled, but its most important function was outlined in

the clause: "It shall consider generally the needs of the county or county borough with regard to all questions of public health, and may make such reports and recommendations with regard thereto as it may think fit." In his speech on May 4, 1911, Mr. Lloyd George attached great importance to this duty of the Local Health Committee, and in a Memorandum issued later he said: "The new authority will have an invaluable amount of statistics at its disposal which will enable it to locate any 'black spots' in any trade or district very quickly." Unfortunately, when the administration of medical benefit was taken away from the Approved Societies, and assigned to this new local authority, the whole character of the latter was changed. The name "Local Health Committee" disappeared and was replaced by "Insurance Committee"; and the duty to "consider generally the needs of the county or county borough with regard to all questions of public health" was no longer required. Insurance Committees still have power to make reports on the health of insured persons and are also required to provide lectures on health; but in actual working, the time of these bodies has been so fully occupied by administrative details, that their Public Health functions have been almost entirely unexercised. Where Local Health Committees might have been making exceedingly valuable investigations into infant mortality, adulteration of food, bad housing, atmospheric pollution, prevention of tuberculosis, etc., Insurance Committees have spent their time in preparing and maintaining registers and panel lists; in discussing such questions as to whether doctors may write "Rep. Mist." instead of a prescription; in negotiating with chemists over the cost of drugs and pricing prescriptions; in keeping voluminous accounts; and in deciding the maximum number of eggs or pints of milk which may be given under "domiciliary treatment" to a person in an advanced stage of phthisis. The change has also seriously increased the complexity and cost of administration. The administration of medical benefit was removed from Approved Societies to Insurance Committees in order to meet the wishes of the British Medical Association; but judging from the widespread

dissatisfaction with the present arrangement it is doubtful whether the doctors have really gained anything by the change. On the other hand the abolition of the Local Health Committees was undoubtedly a disastrous step so far as the interests of Public Health are concerned.

Medical Benefit

The value of the panel system from the Public Health point of view in providing medical attendance and treatment has already been considered, and it was shown that, on the whole, the standard of treatment among the insured class is no better than that which prevailed before the passing of the Act. It is now necessary to consider this benefit in relation to the light it throws upon the methods of dealing with Public Health questions in Parliament and by the Administrative Departments.

Medical benefit is defined in Section 8 of the Act as "Medical treatment and attendance, including the provision of proper and sufficient medicines and such medical and surgical appliances as may be prescribed by regulations to be made by the Insurance Commissioners," and in Section 15 the Insurance Commissioners are required to secure that insured persons shall receive *adequate* medical attendance and treatment from the medical practitioners with whom arrangements are made. The Bill was some nine months in its passage through Parliament, but it is not possible to find in the whole course of the discussions any clear indication of the scope of treatment, or of the meaning which Parliament intended to attach to these words. It has already been pointed out that specialist services and institutional treatment are by far the most crying needs among the working classes, and no system can be regarded as "adequate," in any ordinary sense of the term, which does not provide these. Nevertheless, it does not appear that Parliament recognised their importance; and the Act finally left the House with medical benefit so incompletely defined that the Commissioners have been able to give it a meaning which, it is safe to say, the majority of legislators would not have sanctioned had

they been able to anticipate the Commissioners' interpretation. The mere fact that any doubt could arise as to the interpretation of so important a provision, constitutes a strong argument for assigning the drafting of future Public Health measures to a Ministry of Health.

Definition of the scope of medical treatment being accordingly left to the Commissioners, that body proceeded to lay down that an insured person is entitled only to "such treatment as is of a kind which can consistently with the best interests of the patient be properly undertaken by a practitioner of ordinary competence and skill," and it may be recalled that these words have now the force of an Act of Parliament. We will consider this definition from its Public Health and legal aspects separately.

From the Public Health point of view the decision was disastrous. The Regulations did not even prescribe the highest standard of general practice, and at a stroke of the pen all opportunity of providing consultant services, institutional treatment, surgical procedure, and nursing was lost. It is true that when the extra Parliamentary grant for the doctors was provided, a half-hearted attempt was made to couple this with provision of facilities for laboratory examinations, but no such facilities were in fact provided. The system has given panel practitioners an opportunity of charging insured persons for services which they held were outside the scope of their contracts, and it has led to disputes as to what services might be regarded as within the scope of a practitioner of ordinary competence and skill. To settle these disputes the Commissioners have adopted the remarkable course of appointing an outside body of Referees to whom the differences are submitted; thus declining responsibility for the interpretation of a definition which they themselves had framed.

From the legal point of view it is open to doubt whether the action of the Commissioners can be justified. Although the word "adequate" is not defined in the Insurance Act, there are several arguments which tend to show that it does not bear the exceedingly narrow meaning given to it by the Commissioners. We may for example refer to

another Act of Parliament in which the same word is used, and note the meaning which has been given to it by the Courts. Section 12 of the Children Act of 1908 provides that " a parent or other person legally liable to maintain a child or young person shall be deemed to have neglected him in a manner likely to cause injury to his health if he fails to provide *adequate food, clothing, medical aid, or lodging* for the child or young person." Under this clause parents have been convicted for failing to have defective eyesight in their children treated, and have been required to provide spectacles for them. A parent has also been prosecuted and convicted for refusing to have an operation for adenoids performed on his daughter.[1] If these actions by the Courts are legally correct, the words " adequate medical aid " in the Children Act clearly include at least special treatment of the eye and throat, and it is difficult to see why the words " adequate medical attendance and treatment " in the Insurance Act should bear any lesser meaning.

The Insurance Act itself contains a schedule of additional benefits which Approved Societies may give when their funds permit. These benefits include medical treatment and attendance for dependents of insured persons; payment of the cost of dental treatment; increase of sickness or maternity benefit; assistance during convalescence; payment of superannuation allowances; repayment of the whole or part of contributions, etc., etc. They do not include any power to provide the services of consultants, surgeons, or gynæcologists, or any form of institutional treatment except for convalescents. If these services are not included in medical benefit, then they cannot be provided under the Insurance Act at all. It is surely reasonable to suppose that the Act provides a complete medical service for insured persons, before benefits are extended to persons outside the Act, or contributions are reduced; if not it becomes simply ludicrous.

There is a curious admission in the " Conditions of Service for Practitioners " laid down by the Commissioners, which indicates that the Commissioners themselves were

[1] Report of Chief Medical Officer to Board of Education, 1912.

not satisfied that the panel system was adequate. Clause 2 of these conditions runs as follows :—

> Where the condition of the patient is such as to require services beyond the competence of an ordinary practitioner, the practitioner shall advise the patient as to the steps which should be taken in order to obtain such treatment as his condition may require.

It is clear therefore that the Commissioners anticipated that conditions would occur among insured persons for which the panel service would not provide adequate treatment, and in securing that these persons should receive only " advice " instead of the treatment their condition demanded, the Commissioners were not carrying out the intentions of the Act.

These arguments are reinforced by Mr. Lloyd George's own interpretation of the powers of the Act. In his speech to the Advisory Committee on January 2, 1913, more than a year after the passing of the Act, he said, speaking of a salaried service :—

> I will show you what this means. We thought that we should have had an opportunity of setting up a service of this kind at Bradford. Bradford was very anxious for it. There was a real demand from the working classes for it. The doctors were very very obdurate, and we worked up our plan. Now the doctors came in in time ; and so there is no salaried service at Bradford. But I will just show you how it would have worked out within the money available. You have 100,000 insured persons in Bradford. You have 7s. or 7s. 6d. as the case may be. That depends upon the debateable 6d. for drugs. If you make it 7s. that is £35,000. If you make it 7s. 6d. that is £37,500. We proposed to engage 50 doctors at £500 a year. Then we thought it would be necessary to have a certain number of consultants and specialist surgeons, so that it was proposed the service should include three specialist surgeons, one of them being an oculist, and that at the head of the service there should be a consulting physician, a superintendent at a salary of £1200 a year. The specialist surgeons were to receive £1000 a year. With the remaining £8000 we proposed to get other assistance for the doctors. We proposed that there should be 50 nurses. You will find that still there would be something to spare, especially on the 7s. 6d. basis, for the provision of aids to exact diagnosis which pathology and bacteriology have placed at the disposal of modern medical science.

For the moment we are not concerned with the reasons

why this service was not established. The important point to notice is that the authorities *had already decided to establish it*, and had been able to come to this decision without going to Parliament for further powers. It was clearly at that time their conception of what constituted an ' adequate ' service. If this service could not legally be provided, then Mr. Lloyd George's speech was mere ' bluff.' On the other hand, if it is the correct interpretation of the Act, then for four years the Commissioners have not been fulfilling their legal obligations.

On the other side of this question there are two points which in fairness to the Commissioners must be noticed. In the first place, the statement has been freely made (for instance in the Fabian Society's Report) that since Mr. Lloyd George had been obliged to give the doctors all the money available under the Act, as well as an additional $1\frac{3}{4}$ millions by a special Parliamentary grant, there was nothing left to pay for consultants and special services. If this statement is correct, it reveals a curious state of affairs. It means that Parliament passes an Act intending that certain things shall be done; and the persons appointed to carry out this Act find that there are not sufficient funds for the purpose. Instead of reporting to Parliament that they have been asked to undertake an impossible task, and leaving the legislature to decide whether the things proposed should not be done, or what part of them should not be done, or whether additional funds should be provided to carry out the whole programme, the administrators themselves, or the minister responsible for the Department, decide which part of the duties assigned to them shall be done, and which part shall be disregarded. This is of course the complete substitution of bureaucracy for Parliamentary Government.

The second point which might be urged in defence of the course taken by the Commissioners is, that the Act requires them in the first place to arrange for a list of practitioners in each district who will undertake treatment of insured persons, every qualified practitioner having the right to be included in such lists. But there is an important proviso to these clauses which runs :—

Provided that, if the Insurance Commissioners are satisfied after inquiry that the practitioners included in any list are not such as to secure an adequate medical service in any area, they may dispense with the necessity of the adoption of such system as aforesaid as respects that area, and authorise the Committee to make such other arrangements as the Commissioners may approve; or the Commissioners may themselves make such arrangements as they think fit, or may suspend the right to medical benefit in respect of any insured persons in the area for such period as they think fit, and pay to each such person a sum equal to the estimated cost of his medical benefit during that period.

But while the Commissioners were thus bound to initiate the panel system, there does not seem to be any reason in the Act why they should not have strengthened it by appointing to each panel a staff of consultants and specialists; for the word 'practitioner' includes specialists as well as *general* practitioners. It has been argued against this view that the Act only entitles an insured person to the services of one medical man; but this limitation clearly only applies to his right to *choose* one medical practitioner from the panel list. There is no prohibition against his receiving additional attendance from a consultant, though he has not the right to select this consultant. As a matter of fact, the Commissioners do appear to contemplate an insured person receiving services from two doctors simultaneously, for in a few districts where the system of 'payment by attendance' has been adopted by the panel doctors, instead of payment by capitation fee, the list of services officially recognised by the Commissioners as those for which payment can be made includes: "Surgical operation requiring local or general anæsthetic," and "Administration of general anæsthetic." It can hardly be supposed that the Commissioners intended one and the same person to perform an operation and give a general anæsthetic. Moreover, the first series of Regulations issued by the Commissioners in October 1912 contained in the list of services entitling to payment, "Consultation: (*a*) for the ordinary attendant; (*b*) for the consultant (if himself a practitioner on the panel)." It is significant that this entry disappeared in later issues of the Regulations.

But though the Commissioners are empowered to make

other arrangements where the service is inadequate, they have never made any public inquiry into its efficiency. Previous to the middle of 1914, when the outbreak of war rendered such a course impracticable, the Commissioners could at any time have acquainted themselves with the conditions in poor-class districts, the overcrowded waiting-rooms, the 'lock-up' surgeries, the hasty and inefficient attendance, and other evils which have been so fully investigated and made known by independent bodies. With their extensive powers they could have strengthened the service in the worst districts, and could even have gone the length of establishing a whole-time medical service if necessary. It is more and more frequently urged that the present panel system should be supplanted by a national medical service. The arguments for and against this proposal will be considered in a later chapter, but here it may be noted that as far as insured persons are concerned, no further legislation is required for this purpose, and that the Commissioners can not only establish such a service, but are actually bound to improve the present system if they find it inadequate; while from the estimates given by Mr. Lloyd George in regard to Bradford, it may be inferred that the present funds are ample to provide for this service.

In a letter to the *Times* of January 3, 1912, Sir Clifford Allbutt said: "In his Insurance Bill the Chancellor was content with an antiquated notion of medicine and of medical service; he took for granted, without inquiry, a notion built of some vague knowledge of village clubs, and of the old-fashioned *vade mecum* way of doctoring. This is, 'For such and such a disease such and such a drug; take the mixture, drink it regularly, and get well if Nature will let you.' And if our people have ceased to check the doctor's bill by the pill-boxes, bottles, and pots on the shelf, even Cabinet Ministers have not escaped from this ancient habit of thought."

This conception of medical treatment has apparently governed the administration of the Act, and no effort seems to have been made to rise above the standard of treatment among the old Friendly Societies, or even to

investigate the needs of the community. Nor is the insufficiency of the service the only evil. The panel system has increased the element of commercialism in medical practice; it has done nothing to strengthen the interest of the doctor in the scientific side of his profession; it has led to considerable ill-feeling between non-panel and panel practitioners; and it has brought about the evil foreseen from the first, that of establishing a distinction between the 'rich man's' and the 'poor man's' doctor.

The Supply of Drugs

The history of the drug supply under the Insurance Act affords some interesting lessons in official muddle and extravagance. Out of every nine shillings paid for medical benefit, approximately two shillings represent the cost of drugs and medicines. For 14 million insured persons, therefore, the total annual cost is £1,400,000, and this is exclusive of certain supplementary sums and cost of administration. Previous to the Insurance Act it was the custom in working-class practice for doctors to dispense their own medicines, but Mr. Lloyd George assigned this work to chemists, for the reason which he gave in the House of Commons, that 'there ought to be no inducement for underpaid doctors to take it out in drugs.' This step substantially increased the expense. The special investigation made later by Sir William Plender for the Government, showed that the average cost of drugs to doctors practising in towns, including dispensers' fees, etc., was 5d. per head of the population. In a series of Friendly Society Institutes, with an aggregate membership of 75,500, the average cost of drugs, including bandages, dispensers' salaries, etc., was 10d. per member. It is clear, therefore, that the mere change of system involved an additional cost of at least £700,000 annually. It is probable that the Government did not even know the cost of drugs, when supplied by doctors, until Sir William Plender made his inquiry nearly a year after the Insurance Act had been passed.

We must now note how far this costly change of system has achieved its object, viz. that of improving the quality of drugs supplied. The Government offered the chemists a capitation fee of 1s. 6d. per insured person for the supply of drugs. The chemists, through the Pharmaceutical Society, expressed the view that this amount was insufficient. Eventually the question was settled by the establishment of the 'floating sixpence,' an arrangement which was described by Mr. Lloyd George as follows: "The doctor is the only person we can trust to check "drugs. We are going to leave that 6d. there between the "doctor and the chemist. It will provide £320,000. That "£320,000 will be available if the drug bill exceeds the "1s. 6d. provided; and where it does not exceed that "1s. 6d. it will be available for the doctor. That is not the "case with regard to the 1s. 6d. I want to make it clear "that, at any rate up to 1s. 6d., there ought to be no induce-"ment to the doctor to cut down the drugs. We want the "best drugs available in the market for the treatment of "the industrial population of this country, in the interests "of the State as well as for humanitarian reasons, and we "realise that it will be necessary to have at least 1s. 6d. "available for the provision of drugs."[1] Thus, after taking away the dispensing from the doctors because they could not be trusted to supply good drugs, Mr. Lloyd George finds, eighteen months later, that they are the only persons whom he can trust to check drugs; and while reiterating his demand for the best drugs in the interests of the State, he gives the doctors a direct financial interest in prescribing the minimum amounts and cheapest qualities.

But soon pressure was brought to bear from other directions to reduce the cost of drugs. The Commissioners gave tacit assent to a tariff which was drawn up by the Pharmaceutical Society, and at the end of 1913, and still more at the end of 1914, the fund, even with the aid of the 'floating sixpence,' was insufficient in many localities to pay the chemists in full, and their bills were accordingly discounted 10, 20, and even 30 per cent. This gave rise to great dissatisfaction among the chemists, and to meet

[1] *Supplement to British Medical Journal*, October 26, 1912.

their complaints efforts were made by the Insurance Commissioners and Committees to reduce the supply and cost of drugs. All thought of providing only the 'best' drugs went to the winds. Expensive drugs were eliminated from the lists, 'stock' mixtures were introduced, tap-water was substituted for distilled water, and finally a system of investigating practitioners' prescriptions was established in order to put a stop to what was termed 'excessive prescribing.' Many doctors who in May 1911 were to be under no restrictions in supplying medicines were now required to attend before tribunals to justify their orders for medicines in particular cases, and were liable to surcharge.[1]

Under these circumstances it is not surprising that there have been numerous complaints as to the quality of drugs supplied and of faulty dispensing by panel chemists. For instance, in Salford, out of nineteen samples of mixtures dispensed under the Insurance Act which were analysed by the borough chemist, eight were found to be unsatisfactory. In Birmingham, nineteen prescriptions by panel doctors ordering a mixture and a paint were analysed, and sixteen samples of medicine from twelve chemists were found not to have been properly dispensed. In an inquiry by the Insurance Commissioners in Manchester, it was shown that among 17,000 prescriptions dispensed by one firm, 3000 were *prima facie* irregular. A doctor who gave evidence said that he had examined 3194 prescriptions signed by him, and about 2000 contained improper alterations. It would appear therefore that insured persons are at least no better off than they would have been if dispensing had been left in the hands of the

[1] The following extracts from Memo. No. 648/I.C., issued by the Scottish Commissioners in July 1915, illustrate the official pressure which was brought to bear upon the doctors :—

"For the guidance of practitioners it is suggested that every prescription should in the meantime conform to the following conditions :

"(1) The quantity prescribed at one time should be strictly limited.

"(2) The drugs employed should be, *ceteris paribus*, the least expensive of their class.

"(3) Flavouring agents should be reduced to a minimum, and the more expensive, where a less costly equivalent is not available, should be restricted to cases in which therapeutic benefit would not be obtained without their use.

"(4) Drugs should be put up in the least expensive form consistent with the requirements of the case."

doctors. Indeed it is not clear that the charge that doctors were wont to 'take it out in drugs' is, as a general statement, substantially true. In country districts where no chemist is available, panel practitioners are allowed to do dispensing, but, so far as the writer is aware, complaints against these doctors have not included any of supplying bad medicines.

Early in 1915 the Commissioners seem to have come to the conclusion that the original drug tariff drawn up by the Pharmaceutical Society, which without adequate investigation they had allowed to form the basis of contracts between Insurance Committees and chemists all over the country, might be revised; and accordingly a Departmental Committee was appointed for the purpose, and issued a report in September. This report showed that the tariff was full of anomalies and defects, and that although occasionally imposing hardships on chemists, it yielded high profits on a large number of drugs and prescriptions. A new tariff based upon commercial principles was drawn up by the Committee, and came into force in 1916. Thus four years after the Insurance Act was passed, the supply of drugs was for the first time placed upon a business footing. But even now the muddle is not at an end. The 'floating sixpence' is still retained, and since its division between the chemists and the doctors was based upon the old tariff, this tariff must be maintained for the purpose; thus in every district the cost of drugs must be determined twice over and on two separate scales.

The system of supplying drugs under the Insurance Act has involved an immense expenditure of labour and time. A glance at a few agenda of Insurance Committees will show that chemists' accounts and questions of drug supply form one of the matters most frequently under consideration. The checking and pricing of the millions of prescriptions has entailed the appointment of numerous salaried accountants with staffs of checkers and sorters. The Insurance Commissioners have issued sheaves of reports and circulars, including a 'Ready Reckoner' for arriving at the prices of ingredients of prescriptions to the second

place of decimals.[1] Numerous Committees of Inquiry have been constituted by chemists, doctors, and officials, and voluminous reports have been issued. On the other hand, an additional shilling to the doctor's capitation fee for dispensing would have paid the doctors very well in view of Sir William Plender's report, would have saved the country half the cost of the present system, secured at least as good a supply of drugs, and averted endless dissatisfaction and confusion. The tragedy of this waste becomes all the more apparent when we realise how utterly disproportionate is the benefit to the health of insured persons derived from the whole system.

The duty of drawing up a schedule of medical and surgical appliances for insured persons was also left to the Commissioners. The list consists of ordinary dressings and ice-bags, splints and catheters. Other appliances are however urgently needed, particularly trusses, which many of the Friendly Societies formerly supplied free of charge. The cost of these would probably be covered many times over by their enabling persons sooner to resume their work.

Sanatorium Benefit

This benefit is defined in the Act as: "Treatment in sanatoria or other institutions or otherwise when suffering from tuberculosis or such other diseases as the Local Government Board with the approval of the Treasury may appoint." To meet the cost, Parliament provided a capital sum of one and a half millions for grants in aid to sanatoria and similar institutions, and an annual contribution of 1s. 3d. per insured person, equivalent to an annual sum of one million. Sanatorium benefit may be extended to dependents of insured persons, and if in any

[1] The *British Medical Journal* of January 29, 1916, criticising this Ready Reckoner, says: "It occupies twenty-four foolscap pages of figures with two pages of description as to their use, and a page is also devoted to an account of the twenty-three varieties of dispensing fees, which will probably be a source of endless questions and disputes. The Ready Reckoner will undoubtedly save much trouble to the pricing staffs, with a consequent saving of expense, but one cannot help feeling that in the years to come it will be regarded, with the cumbrous system for which it stands, as a curious relic of antiquity."

district the annual amount available to meet the cost is insufficient, the deficit may be made good by the county or county borough paying one half, and the Treasury paying the other half.

This benefit also has in practice proved very different from what appears to have been intended by Parliament. Throughout the debates the importance of providing sanatoria for the tuberculous was insisted upon, and it was clearly for this purpose that the money was intended mainly to be spent. But when Mr. Lloyd George made the financial arrangements with the doctors, the scheme was widely altered. "Domiciliary treatment," a term which does not occur in the Act and was not heard in the debates, was invented, and 6d. was taken from the 1s. 3d. to pay the doctors for this treatment. Now domiciliary treatment is simply ordinary medical treatment by a general practitioner, with the addition of a small weekly allowance of milk, eggs, or cod-liver oil, and sometimes the loan of a shelter to be erected in the back garden. At the present time the majority of the tuberculous insured persons are receiving their sanatorium benefit in this form. The funds for the maintenance of sanatoria have been raided to the extent of 40 per cent; the 'chain of sanatoria throughout the country' is still far from complete, and many persons whose condition demands institutional treatment are unable to obtain admission into sanatoria or other institutions. Legal justification for this course is found in the words 'or otherwise' in the Act; but in reality it was simply a means of transferring a sum of money from one fund to another, and it illustrates again the extent to which an Administrative Department or a Minister can alter an Act of Parliament. Had the legislature been aware that instead of the great benefits promised being realised, two-fifths of the sum provided for the maintenance of sanatoria would be allocated to an entirely different and inferior form of treatment, it seems very doubtful whether it would have agreed to the scheme.

Dispensary treatment, a form of treatment which brings the patient under the cognisance of an expert tuberculosis officer, has undoubtedly proved more useful, mainly for

purposes of diagnosis. Sanatorium treatment requires detailed consideration.

Sanatorium treatment of tuberculosis arose from the observed value of breathing pure air in the treatment of phthisis, and was first developed on an extensive scale in Germany and the United States. The treatment consists essentially in spending as much time in the open air as possible, together with adequate and appropriate diet, suitable exercise, rest, and medical care. During early years there was a tendency to exaggerate the value of the treatment, almost certain cure being promised provided the disease was not too far advanced. Later experience modified these sanguine expectations, but nevertheless established that in sanatorium treatment we had a valuable means of combating tuberculosis in appropriate cases. It was found that after a residence of from six to eighteen months in a sanatorium, the disease might be permanently arrested in some persons who were not suffering from it in an advanced form, while others were substantially benefited and their lives prolonged, even if they eventually succumbed to the malady. But it was one thing to improve patients while under treatment, and another to maintain that improvement after they left the sanatorium. It soon became clear that discharged patients, if they are to benefit permanently by their treatment, must continue to live under conditions approximating to those within the sanatorium, *i.e.* lead an out-door life in pure country air, with abundance of nourishing food and perfectly hygienic surroundings. Patients who go back to sedentary occupations in close, ill-ventilated rooms or factories in a crowded and smoky city, are almost certain to suffer a recurrence of the disease.

The earlier optimistic beliefs in the efficacy of sanatorium treatment were drawn mainly from the experience of paying institutions opened for the wealthier classes. These are, however, just the people among whom the best results might be expected, since they are in a position to make the necessary modifications in their form of living and some spend months of each year in health resorts. To suppose that anything like such good results would follow

the provision of sanatorium treatment for an industrial working-class population was to ignore wholly the necessities demanded after the actual period of treatment. Yet this was done under the Insurance Act. Insured persons suffering from tuberculosis have received treatment in sanatoria for some months, though frequently for too short a period to derive the full advantage, have gained markedly in health, and have on their discharge figured in the statistics as 'cured' or 'improved.' They have then gone back to their old environment, and after a longer or shorter period the disease has reasserted itself. The opinion is now widely held among Tuberculosis Officers and Medical Officers of Health that sanatorium treatment is of comparatively little value among the working classes. In support of this statement the following opinions of persons specially qualified to judge may be quoted:—

Dr. Squire, the adviser on sanatorium benefit to the London Insurance Committee, has said in a report: "In chronic cases—where the disease though not active is still smouldering—cure or complete arrest is improbable, and the most that can be anticipated from institutional treatment is such improvement in general health as to allow of a temporary return to work, the duration of which will be largely conditioned by the nature of the employment and the hygienic environment to which the individual returns on leaving the institution. Thus, patients returning to a poverty-stricken home are likely—or indeed almost certain—to break down soon after their return, and the benefit derived from the treatment is of little practical value. Economically the benefit derived is not worth the expenditure on the treatment. A few weeks' stay in an institution from which they return to conditions under which they quickly revert to their previous state of ill-health is of little practical utility either to themselves or to the community."

At a meeting of the Northern Branch of the Society of Medical Officers of Health, December 1915, Dr. Dickinson, the Tuberculosis Officer for Newcastle, said: "One is bound to confess that sanatorium treatment of the phthisical poor has never come up to expectations, and practically never results in the cure of open tuberculosis. . . . In my experience the results are uniformly bad amongst children who have tubercle bacilli in their sputum." Dr. Hemborough, the County M.O.H. for Northumberland, considered that sanatorium patients would derive little permanent benefit from the treatment so long as they had to return to the bad home-conditions under which so many of them lived. Dr. Taylor, M.O.H. for Chester-le-

Street, said that it was useless to treat a man in a sanatorium, where he lived under ideal conditions, and then discharge him to an ill-ventilated, insanitary home, where the family convenience was a bar to everything he had been taught. Dr. Renney, M.O.H. for Sunderland, considered that ill-ventilated and closely crowded dwellings were the great unit in the spread of infection. The poorer sanatorium patients almost invariably declined after returning home. Dr. A. Smith, M.O.H. for Whickham, said he had latterly come to regard the infectiousness of phthisis as over-emphasised. . . . Notwithstanding all that had been done under the Insurance Act and by the tuberculosis dispensary, the death-rate from phthisis in his district was markedly higher than previously. Dr. Allen, the President of the Society, was disappointed with the results of sanatorium treatment. Poverty and insanitary home-conditions were all against sanatorium patients after their discharge. Not one speaker at this meeting spoke in favour of sanatorium treatment among the working classes.

Dr. Guy, the Tuberculosis Officer for Edinburgh, said in a recent report: "The housing question is one of the vital points in dealing with the problem of tuberculosis. Hitherto we have heard a great deal about sanatoria, etc., and too little about these houses. The disease should be attacked there; and my opinion inclines to the belief that if all the money which is at present being poured out on sanatoria had been spent on an improvement of housing conditions, the results would certainly not have been less satisfactory."

Dr. Williamson, the M.O.H. for Edinburgh, has said: "Sanatoria and dispensaries are not of themselves likely to be attended by markedly beneficial results in the absence of other definite preventive measures."

Dr. J. E. Esslement, Medical Superintendent of the Home Sanatorium, Bournemouth, after pointing out the advantages of sanatorium treatment, at a congress on tuberculosis in 1914, said that sanatorium treatment, however, had great limitations. As a means of stamping out tuberculosis the great expectations with regard to its efficacy had not been realised. It was expensive. Treatment could seldom be carried out for longer than three or six months. Cures were seldom complete, and little was accomplished in preventing the spread of infection in the community. In Germany in 1910 there were 800,000 infectious cases of tuberculosis; 41,262 received sanatorium treatment, but of these only 3300 were rendered non-infectious.

Statistics relating to the condition of patients on discharge from sanatoria are of little use as a means of measuring the value of the treatment, since the terms employed, 'disease arrested,' 'condition improved,' 'fit for work,'

etc., are unavoidably indefinite, and give no indication of the state of patients one year and two years after discharge. When we examine the reports of individual sanatoria which do give this information, the results are often melancholy. For instance, from a report by the Clerk of the Insurance Committee of the County of Ayr, we learn that of 237 persons who were sent in 1914 and 1915 to sanatoria, 69, or nearly one-third, were dead by the middle of 1916. Yet these appear to have been cases selected as favourable for the treatment, since others were sent to hospitals or infirmaries, or were refused benefit on account of the disease being too far advanced. Of 49 persons treated in 1915 in the Paisley sanatorium, 12 were discharged improved, 10 not improved, 3 left, 15 died, and 9 were still under treatment.

When we examine the mortality returns for the whole country, which should reflect the influence not only of sanatorium treatment but also of tuberculosis dispensaries and domiciliary treatment, we find little encouragement for the belief that sanatorium benefit has had any appreciable effect in reducing tuberculosis. The death-rates from phthisis in England and Wales were: 1017 per million in 1912; 989 in 1913; and 1022 in 1914. While for 1915,[1] admittedly under exceptional circumstances, the rate, 1140, was higher than in any year since 1907.

While admitting that a certain number of persons have derived benefit from residence in sanatoria, and a larger number have received care and attention which they could not have obtained at home, there is no doubt that sanatorium benefit as a means of preventing and curing tuberculosis has been a great and costly failure. It was not suitable for application to the working classes; it does nothing to destroy the environmental causes of the disease; it has led to the outpouring of large sums of money which could have been much better employed in clearing overcrowded areas; and, saddest of all, it has created

[1] At the time of writing, the Report of the Registrar-General for 1915 is not published. The death-rate from phthisis, which relates only to the civil population, is however given in the Report of the Chief Medical Officer to the Board of Education. The increase though highest at military ages is not confined to those ages.

hopes in the minds of many thousands of poor persons torn by disease, which have not been and could not have been realised.

For the purposes of this book it is necessary to examine how this great mistake came to be made, and here again we are bound to recognise the effect of Mr. Lloyd George's personal influence and optimism. On July 7, 1911, he said in the House of Commons :—

> If this experiment is a success, and it becomes perfectly evident that it is effectively stamping out consumption, it will be a great mistake for the State not to face any liability within reason in order to effectively stamp out this scourge altogether. . . . I am a believer in sanatoriums as my hon. friends are; but it is an experiment. There are doctors in this country of great experience who are not quite so confident as to this being the best method of stamping out consumption. I think it is worth while making the experiment, and it is worth while making it well. . . . Some one suggested that the danger was that this provision will be for the better class. As a matter of fact, it is for the wretched people who have no homes where they can be cured that these sanatoriums will be most useful. . . . I invite the House to try the experiment on this very considerable scale—£1,500,000 towards building and £1,000,000 towards maintaining them.

On July 12, 1911, Mr. Lloyd George said :—

> A good many remedies which after years of struggle have managed to secure the approval of the profession have come to stay, and the case of sanatoria is a case of that kind. It is not something which has been suggested within the last few years. It is something which was suggested a good many years ago—I forget how many; but I am not sure it is not forty or fifty years ago when an English doctor tried the experiment. It has been a long experiment, and it has gone through the same stages as every other successful experiment. It has taken very many years to convert the faculty, and it is only because the experiments extending over a good many years have been a success that doctors have been at last convinced that there is a good deal to be said for it. I do not therefore put it in the same category as a sort of fashionable craze. It is something tried and tested by the most severe test of all, the test of experience extending over something like two generations.

It may be noted that the only experiment at that time made on a national scale was in Germany, the results of which had been anything but encouraging.

The right hon. gentleman quoted in the debate the experience of the Hearts of Oak sanatorium and the Post Office sanatorium. But in these two together the total number of cases tabulated was only 226 ; the results were described under the vague headings ' disease arrested,' ' improved,' ' unimproved ' ; and the information related to condition on discharge. Nevertheless, on these utterly inadequate data, Mr. Lloyd George committed himself to the general statement : " This shows that experiments in this country have been a very considerable success."

Mr. Lloyd George was not left uninformed that much expert opinion was against his views. In the course of the debate, Mr. Walter Long, an ex-President of the Local Government Board, said :—

I can find no reliable evidence to show that treatment in sanatoria has been really effective. . . . The results so far as real cures are concerned have so far been very moderate. . . . Messrs. Elderton and Perry, of the Department of Applied Mathematics, University College, as a result of their study of the " Mortality of the Tuberculous and Sanatorium Treatment," arrived at the following conclusions : (1) the mortality of tuberculous patients treated in sanatoria, even when the disease is taken in an incipient stage, is four times as heavy as in the general population, and (2) that the mortality of the apparently cured (sanatorium) is twice as heavy.

Dr. Hillier quoted Professor Koch that, " neither in Germany nor in any other country had the really necessary measures for preventing the disease been taken," and added:

. . . any proposal which merely regards sanatoria as places for the treatment of early phthisis, or places where advanced cases may be treated and then allowed to go back to the family, really fails to achieve the first requirement of any great preventive measure.

Mr. Arthur Lynch said :—

I wish to speak more in regard to the importance of research. . . . You may spend millions of money upon sanatoria, and ten years afterwards when you take a retrospect of what has been accomplished the answer may be almost nothing. . . . There is a powerful school of medicine, comprising, broadly, those who are in the forefront of bacteriological work, who doubt whether much advantage scientifically is derived from sanatoria if limited to the expectant treatment. . . . Before sitting down I should like to propose the impossible, that is, I think all this is a case for special examination by a special committee.

Dr. Esmonde said :—

I would ask the Chancellor of the Exchequer not to spend his million and a half on large buildings which may be utterly and completely useless within a few years, but to spend a good deal of it in research. . . . Experience of the plan of sanatoria is that a person goes to one of these institutions believing that he is going to get well because he has got the disease in the first stage; he comes back to his home and after a very short time dies. We have really nothing definite to go upon, and any man in general practice in this country during the last twenty-five years must be deeply despondent at the results which have been achieved.

Other opinions might be quoted, but these are sufficient to show that adverse criticism now of sanatorium benefit is not an instance of 'being wise after the event.' Medical and expert opinion in 1911 held that sanatorium treatment was a useful measure in certain selected cases, among people who could continue to live under hygienic surroundings, but it never endorsed the sweeping statements and proposals of the Chancellor of the Exchequer; and those members of the House of Commons best qualified to judge pleaded for further investigation.

It was however apparently German experience which most influenced Mr. Lloyd George, and he quoted in detail certain German statistics as justification for his views. But reading his speeches carefully, it is difficult not to come to the conclusion that he had misunderstood these statistics, and he appears equally to have misled those he was addressing. The statistics with which he made most play were those which showed the proportion of persons discharged from sanatoria as *able to return to work*. But he did not state that German authorities use those words to mean not only persons fully capable of working, but also those capable of working in the sense of the sickness insurance law, *i.e.* possessing *one-third of the normal capability*; and it seems clear that they were interpreted by the House of Commons as meaning persons cured of the disease. The statistics showing the proportions discharged as 'cured,' 'improved,' etc., give a much less favourable picture, but Mr. Lloyd George did not refer to these. German writers themselves have exposed the hollowness

of the statistics relating to capacity for work. The *Fürsorgestellen* (Assistance Centres) for phthisical patients have found that a large percentage of patients discharged from sanatoria with the certificate 'fully capable of work' relapse very often within the year. Dr. S. Fuchs-Wolfring (Paris) in a paper which is an amplification of one read in Rome at the Seventh International Congress for Tuberculosis, after showing how small are the results achieved in Germany and how great their cost, says: "It is only the reports of private sanatoria which are distinguished by an optimism which is in direct opposition to facts. These optimistic reports are rendered possible only by the employment of the elastic classifications 'regained capability of work' and 'working capability in the sense of the law,' which are very deceptive and veil the real facts as given in the official statistical reports. The official reports acknowledge that the 'regained capability to work' so far only exists on paper. This method of classification is a cruelty to patients and is misleading from a national economic point of view." [1]

It is true that there has been a considerable decline in tuberculosis in Germany, but there have also been substantial declines in other countries where no special efforts had been made. When the Insurance Act was introduced, the death-rate in Germany from consumption, after many years of sanatorium benefit, was almost 50 per cent higher than it was in England and Wales.

Mr. Lloyd George spoke of sanatorium benefit as an 'experiment,' but it would probably be impossible to alter the scheme now that we have established sanatoria, appointed tuberculosis officers all over the country, and made arrangements with the doctors. We must keep our sanatoria as homes for care and treatment; but we must dismiss the extravagant ideas of cure which were promised. As far as the prevention of tuberculosis and the 'stamping out' of this scourge is concerned, we are exactly where we were in 1911, with the exception that a number of false views have been propagated, and a great deal of money spent for very little return. This however is part of the price we

[1] *Medical World*, May 14, 1914.

must continue to pay so long as we are content to be guided in the profound and difficult problems of Public Health by those who have no special knowledge of the subject.

The complex system of administration set up for sanatorium benefit will be more conveniently examined in Chapter X. in connection with Public Health administration generally.

Maternity Benefit

This benefit has already been examined. It has not had any demonstrable effect in reducing maternal or infantile mortality, but has undoubtedly enabled many mothers to make better preparation for their confinement.

Sickness Benefit

Sickness benefit is a payment of 10s. a week to men and 7s. 6d. to women while 'rendered incapable of work by some specific disease or by bodily or mental disablement.' We have to consider: (1) the conditions which entitle to benefit, and (2), the influence of the benefit in the 'prevention and cure of sickness.'

The difficulties which occur in connection with sickness benefit have given rise to much dissatisfaction. Insured persons complain that they do not always receive the payments to which they are entitled; officials of Approved Societies state that malingering is encouraged and that the doctors' certificates are not reliable; the doctors complain that they are called upon to give unnecessary certificates, that their certificates are questioned and sometimes rejected by lay officials. Approved Societies agitate for more control over the doctors; while the doctors chafe under the restrictions to which they are already subjected.

The root cause of these difficulties is the fact that the right to sickness benefit is based upon an unsound principle. Benefit during sickness is only payable, according to the Act, when a person is 'rendered incapable of work.' In practice it is impossible in a very large number of cases to observe this condition. A person may still be capable of

work—it depends a good deal upon the nature of the work—even if suffering from relatively severe illness. He may be able to work during the early stages of acute illnesses, or while suffering from chronic affections such as tuberculosis, heart-disease, aneurism, etc. Apart from severe affections, it is certain that if the Act were interpreted literally, many thousands of payments in respect of anæmia, dyspepsia, and other conditions could not be justified. What therefore actually happens is that unless the doctor is dealing with a case of obviously incapacitating illness, he pays little attention to the strict requirements of the Act. Established in his mind he has a kind of standard inherited from the old Friendly Society days, and if he thinks that a patient's condition is such that he ought not to work even if he could, or that a period of rest at home will appreciably facilitate his recovery, he gives a certificate for sickness benefit.[1] Thus the doctor and the Approved Society official tend to look at the case from very different points of view. The doctor regards chiefly the interests of his patient and the importance of getting him well; the Approved Society official has his eye upon the funds of the Society, and tends to object to any payments for conditions which do not clearly satisfy him that the patient is incapable of work. With serious illness difficulty does not often arise, but, as we have seen, a considerable proportion of the working classes in large towns are in a chronic state of ill health in consequence of overwork or bad environment, without suffering from any clearly definable disease. A person comes to the doctor in such a condition that if he or she belonged to the wealthier classes, abstention from work would certainly be advised. But it is not possible for the doctor to do more than certify that the patient is suffering from 'debility,' or fix upon some prominent symptom such as 'anæmia,'

[1] Many utterances of panel practitioners might be quoted in support of this view. Dr. Round, the Chairman of the Deptford Panel Doctors' Committee, says, for example: "An old married woman has been under my care and on the funds for some months. She suffers from rheumatic arthritis, and earns her living in the winter as a wood-chopper, and during the summer she washes jam jars. Since when has a woman with rheumatic arthritis been fit to wash jam jars or chop wood, I wonder? Members like this one deplete the funds no doubt, but the Act was instituted for the benefit of such people, and I, for one, am not going to 'bully them' to go back to work."—*Medical World*, December 18, 1913.

' nervous exhaustion,' or ' dyspepsia,' and put that in the certificate. Then comes the Approved Society official, who complains that these are not serious conditions, that they do not incapacitate for work, and that the doctor is not making a careful diagnosis or giving his certificates with justification.

This confusion results from a change having been made from one system to another without suitable adjustments having been introduced. The words ' incapable of work ' really come from the regulations of the old Friendly Societies, and though not interpreted literally even then, difficulty rarely arose, since the doctors knew what the Friendly Societies meant and required. Moreover, the relations between the Friendly Societies and the doctors who were appointed and paid by the Societies, were so close that difficulties when they arose were easily adjusted, and the doctors themselves were interested in the smooth and economic working of the Societies. The transference of the administration of medical benefit to Insurance Committees altered the whole relation of the doctors to the Societies; but no thought seems to have been given to the question whether a form of words which had proved suitable for one system would be equally satisfactory when applied to a totally different system.

The fact that there is not a constant relation between sickness and capacity for work probably explains the apparently excessive amount of malingering among insured persons. Some Insurance Committees have appointed medical referees to examine persons in receipt of sickness benefit, and these referees have invariably found that a considerable proportion of the persons examined were not legally entitled to the benefit. In one large Society, in six months, 12,375 members in possession of certificates of incapacity were requested to attend for examination by the Society's permanent medical referees, as a result of which 1375 declared off the funds voluntarily; 1795 failed to attend for examination; and 3186 of the 9208 examined were declared ' capable of work ' by the referees. It would be an error to suppose that all those found capable of work were deliberate malingerers. Probably the doctors

had considered that the conditions exhibited by the great majority of these persons were such that they ought not to be at work; while the referee, taking the strictly legal view of the position, found himself unable to uphold the doctors' certificates. These considerations also explain why claims for sickness benefit tend to vary with the rate of wages and the general demand for labour. During 1915, when unemployment was reduced to a minimum, sickness claims fell off to a remarkable extent. It might be said that this was due to reduction of sickness in consequence of better food-supply, but probably the main reason is that when wages are good and work is abundant, ailing persons often pull themselves together and go to work, although they are in a condition in which many doctors would give them a certificate of incapacity; just as the business man will sometimes disregard the advice of his doctor to lie up, and will insist on going to his office, perhaps to his serious detriment. When trade declines there is less inducement for persons to remain off the sick list, and in poorly paid occupations—for instance, some forms of women's labour—the amount received from benefit may actually exceed the amount which could be earned in wages. This is the more likely to occur among the large body of persons who are insured for sickness in private societies and organisations besides under the National Insurance Act. Thus, though the condition of the person may be the same at both periods, at one time there is an inducement for him to go to work, and at the other the inducement may be in the opposite direction.

Probably no satisfactory scheme of sickness benefit will be established until the distinction between restoration to health and restoration to working capacity has been clearly recognised, and when recognised, its observance insisted upon. If sickness benefit is to be regarded strictly as a provision for preventing destitution until the recipient is just able to struggle back to work, then a clear intimation of this rendering should be given to the doctors. If, on the other hand, restoration to full health is the first concern, then the benefit should be supplemented without delay by public provision for higher medical treatment,

institutional treatment, nursing, convalescent homes, and all other needs of an invalid which the Insurance Act does not provide and sickness benefit is insufficient to buy; and the patient should be entitled to his benefit as long as he can derive advantage from any of these forms of treatment which would be interfered with by his return to work. In the long run, provision of these services would be the soundest national economy. At the present time sickness benefit, like maternity benefit, is undoubtedly a boon among the working classes during periods of illness, since it may enable the rent to be paid, may provide or help to provide food for the family, and may even save a family on the margin from having to go to the workhouse. But it has little effect in curing or preventing sickness, for it will not enable a patient to obtain what he needs, it will not send him to the country or seaside, and indeed it will usually not even maintain his normal income in health; while a family which is just managing to keep itself afloat with the aid of the 10s. a week is not likely to be living under conditions which prevent sickness.

Disablement Benefit

Disablement benefit, a payment of 5s. a week while incapable of work after the expiration of sickness benefit, is admittedly a form of relief, and, as such, is a useful measure which does not demand criticism; though it may be questioned whether it would not have been better to have made this provision by establishing invalidity pensions rather than by collecting the funds through the complicated machinery of the Insurance Act.

The Insurance Act and Insanitary Conditions

It is now necessary to examine the provisions of the Insurance Act which were specifically directed towards preventing disease by improving environment and attacking causes of sickness. The most ambitious of these is contained in Section 63 of the Act, which gives power to the Insurance Commissioners, or any Approved Society or Insurance Committee, to allege that the sickness among

insured persons for the administration of whose sickness or disablement benefit they are responsible is excessive, and that such excess " is due to the conditions or nature of " employment of such persons, or to bad housing or in- " sanitary conditions in any locality, or to an insufficient or " contaminated water-supply, or to the neglect on the part " of any person or authority to observe or enforce the pro- " visions of any Act relating to the health of workers in " factories, workshops, mines, quarries, or other industries, " or relating to Public Health, or the housing of the working " classes or any regulations made under any such Act or to " observe or enforce any Public Health precautions." The Commissioners, Society, or Committee may then send to the person or authority alleged to be in default a claim for the payment of the extra expenditure alleged to have been incurred through any of the preceding causes, and if they fail to arrive at any agreement with the person or authority, they may apply to the Secretary of State or the Local Government Board for an inquiry to be held.

If, upon such inquiry being held, it is proved that the amount of such sickness has

> " (i.) during a period of not less than three years before the date of the inquiry ; or
> " (ii.) if there has been an outbreak of any epidemic, endemic or infectious disease, during any less period " ;

been in excess of the average expectation of sickness by more than 10 per cent, and that such excess was in whole or in part due to any of the causes enumerated, then the extra expenditure incurred must be made good by the employer or local authority or owner, lessee or occupier of premises, or water company, found to have been responsible.

For the purpose of this Section the average expectation of sickness is to be calculated in accordance with the tables prepared by the Insurance Commissioners for the purposes of valuations, but neglecting excessive sickness due to disease or injury in respect of which damages or compensation are payable under the Employers' Liability

Act, or the Workmen's Compensation Act, or at Common Law.

At first sight these provisions may appear very drastic and far-reaching, but closer examination will show that they are simply bristling with difficulties. At the moment of writing, five years after the passing of the Insurance Act, no steps have been taken to put them into force, and it is exceedingly doubtful whether they ever could be put into force. The great difficulty arises from the fact that the sickness rates necessary to prove the allegation, must be compiled in regard to a definite body of persons who are subject to the influence or neglect complained of, such as the employees of a particular factory, the occupants of an area of bad housing, or the persons supplied with drinking-water by a particular company or authority; whereas all our statistical information relating to sickness is in terms of membership of Approved Societies, a large number of which may be represented among the body of persons in respect of which action is taken. There is no relation between the sickness rates we possess or are accumulating, and those required for the purposes of this Section. Some examples may demonstrate the difficulties arising.

Let us take what is probably the simplest case, that of a factory where, say, 500 insured persons are employed; let us suppose that the allegation is made by an Approved Society which considers that the provisions of some Public Health Act are not being enforced in the factory; and further, for the sake of simplicity, let us suppose that all the 500 employees belong to one Approved Society. In order that the allegation may be proved, the Society will have to keep for three years a special record of the exact numbers of its members in the factory, and their sickness and age and sex constitution. But this number will vary not only from year to year, but from month to month and week to week with normal and abnormal periods of trade activity or depression. Persons will drop out of insurance on marriage, or for other reasons, or will fall into arrears; others will change their Society or go into other employment, or be lost sight of. Experience has shown that

insured persons are not prompt in keeping their Societies informed of changes of address, and whenever a general notice is sent out by a Society or an Insurance Committee a considerable proportion of the notices are returned through the 'dead letter' office. When the number has been arrived at, and the aggregate sickness determined after deducting sickness due to disease or injury in respect of which damages, etc., are payable, it will still be necessary to know the exact ages and sex constitution of the employees in order to apply corrections for the natural excess of sickness among elderly persons and women, for the purpose of rendering the sickness rate comparable with the average expectation of sickness. It is obvious that a Society would find it exceedingly difficult to maintain the close touch necessary to obtain a result within 10 per cent of accuracy with a continually fluctuating group of its members; and when we add the fact that ordinarily the 500 employees will be distributed among a number of Societies the difficulty of even the first step becomes almost insuperable.

But let us suppose that such a rate has been determined, and that it is in excess of the average expectation of sickness by more than 10 per cent. It is now necessary to show that the excess was due, in whole or in part, to neglect of the employer to enforce statutory provisions relating to health in the factory. It would, however, be almost impossible to separate the effect of any particular adverse factor in the factory from other hostile influences acting independently from the factory. In an industrial town a large proportion of the employees may be badly housed, overcrowded, inadequately treated when ill, and living under defective conditions of sanitation. Inebriety may be more than the average; and it may be impossible to disprove the assertion that the excess of sickness was due to climatic conditions, an exceptionally hot summer or severe winter. If in all other respects the operatives were living under healthy conditions, the excess of sickness among them might conceivably be attributed to conditions in the factory; or if these conditions were outrageously bad, they might be held to outweigh other influences.

But in these days of factory inspection it is hardly conceivable that such a state of affairs could continue for three years. Breaches of the Factory Acts are usually relatively small, and it is impossible to imagine that the instances of neglect in the degree usually met with, such as some insufficiency of cubic space, or inadequacy of working arrangements or sanitary conveniences, could ever produce the immense effect necessary to outweigh all the adverse influences usually associated with industrialism.

Nor do these arguments by any means exhaust the possible defences and replies open to an employer. It might happen, for example, that a few cases in excess of the average of a disease accompanied by long illness, such as cancer, for which the employer could not be held responsible, might appreciably raise the average sickness among the relatively small number of employees. If, to take another illustration, it is hoped to avoid this difficulty by applying the process to a much larger number of persons, say some thousands of men employed in a mine, then the difficulties previously described of keeping in touch with this mine population for three years, determining their sickness rates, etc., are proportionately increased.

Taking all these facts into consideration, it is safe to say that no Society with its members scattered all over the country is going to undertake the labour of collecting for three years the evidence, and compiling the rates necessary for a highly problematical result, at the best only repaying them a proportion of the expenditure on sickness and disablement benefit, which would probably cost less to pay without question. The Section also provides that where the excess of sickness is found to be due to an insufficient or contaminated water-supply, the local authority, company, or person by whom the water is supplied must pay the extra cost, unless it can be shown that the insufficiency or contamination arose from circumstances over which they had no control. Let us imagine an allegation against a water company supplying part of a large town. In this instance the Society taking action must ascertain the exact area of streets and houses supplied by the com-

pany or authority, and the numbers, sickness, and details as to sex and age of all its members who live in that area —a practically impossible task. Having found that their sickness rate is 10 per cent in excess of the average, they must then prove that this sickness was due to the bad water-supply, and they must be prepared to refute the defence that the badness was due to circumstances over which the company had no control. Both these involve highly complex scientific questions which would entail costly expenditure upon expert witnesses and counsel.

The Section however does not limit the right to make allegations to an Approved Society, but empowers the Insurance Commissioners or an Insurance Committee to take action, the latter being only able to act on behalf of deposit contributors, while the Insurance Commissioners can act on behalf of any insured persons. Let us see what this would involve if the Insurance Commissioners contemplated taking action against an authority or employer in regard to all the insured persons engaged in a particular employment, or deriving their water-supply from a common source, or living in an area of bad housing. Since there are no general rates of sickness whatever in terms of geographical or administrative areas, the Insurance Commissioners in order to establish the sickness rates on which to proceed with their allegation would have to obtain from every Approved Society which has members engaged in the particular occupation, or supplied by the water-supply, or living in the area of bad housing (which apparently the Commissioners can define as they please), a return showing for three years the number of these members, and the sickness among them, and their ages and sexes; and it must obtain from the Insurance Committee or Committees similar details in respect of deposit contributors. If the number of persons selected for the process is small, then the averages will not be reliable; if the number is large, then the Societies involved may amount to many hundreds. The labour in compiling the sickness rates would be gigantic, and by the time it was finished probably the whole thing would be hopelessly out of date.

There is yet another difficulty. When the allegation

is made against a factory owner, a water company, or a local authority, at least the person held to be responsible is clearly defined. But when action is taken in regard to an area of bad housing, the property impugned may be in the hands of a number of owners, lessees, and occupiers, and the responsibility may be partially shared by the Local Authority. This opens up a prospect of endless dispute and litigation, for even if it were proved that the bad housing of the district were responsible generally for the excess of sickness, it would be almost impossible to apportion responsibility among individual owners, occupiers, and local authorities.

Apart from the hopeless complexity of the machinery of this Section there is another condition which practically nullifies its value for Public Health purposes. Excess of sickness is to be determined by comparison with the 'average expectation of sickness,' which is to be calculated in accordance with tables prepared by the Insurance Commissioners for the purpose of valuations. Presumably an average expectation for each sex, and for each year of age, will be determined for each of the four kingdoms. But the object of the Section is to detect excessive sickness due to local causes, and for this purpose the comparison should be between the group subjected to this special cause of sickness and other persons living under approximately the same conditions except as regards the special cause. What is really required is an average local sickness rate for every district. The comparison with the rate for the whole country takes no note of broad differences due to climatic conditions or general character of the environment or occupation. In the agricultural South of England the standard of comparison would be too high; in the industrial districts of the North it would be inequitably low. In a rural town or district of Sussex it might well happen that a local cause was appreciably increasing the sickness rate among a group subjected to it, above the sickness rate of the district, yet when the comparison is made between the sickness of the group and the average expectation of the whole country, no excess may be apparent, simply because the general conditions of the

district are so healthy. On the other hand, in a crowded mining or industrial town, the general sickness rate may be constantly 10 per cent or more above the average expectation of the whole country, owing to the aggregate evils of industrialism, and it would be impossible to prove that an individual manufacturer was responsible for the excess in his particular mill. As the writer interprets the Act, comparison cannot be made with local sickness rates for the purposes of this Section; but even if it could be, the extreme difficulty of determining those rates remains.

The above paragraphs have analysed the leading principles of Section 63. In detail the whole Section is very vaguely drafted, and contains numerous words and phrases, such as 'any public precautions,' 'any extra expenditure,' 'period,' 'conditions or nature of work,' 'in default,' 'insufficient,' 'contaminated,' 'payable,' etc. etc., which are not further defined, and would give rise to interminable legal argument. These points are investigated in *National Insurance*, by Messrs. Carr, Garnett, and Taylor.

Section 63 of the National Insurance Act was presumably drafted in a Government Department, but it seems impossible to believe that it was ever submitted for criticism to any one with a knowledge of statistical requirements or Public Health administration. It was debated at length in Parliament, but there also no one pointed out its inherent absurdity. This fantastic scheme seems to regard sickness as something which can be measured in a pint-pot, and it is based upon a mechanical conception of society which assumes that human beings can be sorted, grouped, and ticketed in a way that a shepherd would find difficult with his flock. Unlike some Sections of the Act it has not led to a great waste of money; it has been, and will be, merely a dead-letter, but none the less it illustrates the futility of legislating on Public Health without consulting expert opinion.

The Insurance Act and the Advancement of Public Health Knowledge

One of the numerous advantages promised from the Insurance Act was increase of knowledge relating to the

causes of disease. As far as purely scientific investigations are concerned, there is good reason to hope that this promise will be fulfilled. A Research Committee has been set up, and provided with funds amounting to approximately £60,000 per annum. Investigators working under the Committee have already published papers of value, and during the War the Committee has been conducting research in military hygiene. Although one of the least costly, the establishment of this Committee may eventually prove to be one of the most valuable provisions of the Act, though it may be pointed out that the Committee is no part of the general insurance scheme, and could have been appointed independently at any time of the long period during which the need for research has been becoming steadily more urgent and more apparent.

But the Research Committee cannot build without bricks, and it is not constituted to collect for itself the immense mass of information relating to the causes and distribution of sickness which is urgently required for Public Health purposes. It is moreover quite clear that the promoters of the Insurance Act intended that its machinery should be used for the collection of data and advancement of knowledge altogether independently of the scientific investigations undertaken by the Research Committee. Speaking in 1913, Mr. Lloyd George said:—

"To heal disease is good work; to hinder it is best. That will be the work of the Act. An official will go round like an angel of light and ask, 'What is the matter?' 'What can we do for you?' Their wants will be recorded. We shall know what is happening, and, believe me, knowledge is hope. That is what we are going to get from the Act. And we will get it. It was worth you and myself taking off our coats and facing opposition, misrepresentation, calumny, and I thank you. We shall know something about the causes of disease, bad housing, overcrowding, bad industrial conditions, underfeeding, drink—we shall know it all, all the evils that are sapping the vitality of the race, depressing the energies of the people and destroying their lives. We shall know year by year more and more, and as sufficient knowledge accumulates in the

minds of all classes in this country of what is happening, they will put an end to it whatever it costs." [1]

We do not know what official Mr. Lloyd George had in his mind as this celestial visitor, and it is not easy to recognise an 'angel of light' in either an insurance inspector or Approved Society agent, but it is certain that no investigations of the kind indicated have been or are being made. There are however two possible directions in which the machinery of the Act might have been employed in collecting information, viz. reports from Insurance Committees, and records kept by the doctors; but not much can be expected from the first, and in regard to the second the Insurance Commissioners have established a system which completely defeats its object.

Section 60 of the Act places on an Insurance Committee the following obligation:—

> It shall make such reports as to the health of insured persons within the county or county borough as the Insurance Commissioners after consultation with the Local Government Board may prescribe, and shall furnish to them such statistical and other returns as they may require, and may make to them such other reports on the health of such persons, and the conditions affecting the same, and may make such suggestions with regard thereto as it may think fit.

The Insurance Commissioners are then required to send copies of these reports and suggestions to the 'councils of the counties, boroughs, and urban and rural districts which appear to be affected.' The reports and returns must 'enable an analysis and classification to be made of the persons who are deposit contributors.'

Incidentally we may note the extreme degree of centralisation and complexity of administration which this system involves: Insurance Committees not communicating directly to the local authorities in their own district, but reporting to the Insurance Commissioners, who then send the reports back to the local authorities. Up to the present the Insurance Commissioners have not prescribed any reports, and Insurance Committees have done little

[1] *The Times*, January 18, 1913.

on their own initiative, probably because their time is so fully occupied with administrative details. It should be observed however that Insurance Committees are to make statistical returns, which alone possess scientific value, and these returns must at least separate deposit contributors. But at once the Committee encounters the obstacle already described, viz. that while it exercises authority over a defined geographical area, the records of sickness among insured persons in that area are scattered through innumerable offices of Approved Societies all over the country. An Insurance Committee does not even know within a considerable margin of error the number of persons for whom it administers medical benefit. Thus any reports it may make will either refer to small groups about whom it can readily obtain information, such as the inmates of a sanatorium; or will be of a perfectly general character, in which case they will be covering, for insured persons, ground already covered much more fully for the whole community of the district by the Medical Officer of Health.

The greatest opportunity for the collecting of scientific information lay in the medical records kept by the doctors. One of the conditions attached to the extra Parliamentary grant for medical benefit was that the doctors should keep these records, solely for the advancement of medical knowledge. They are quite distinct from the sickness certificates, and are not required for any other purposes, financial or administrative. The Commissioners seem however to have failed entirely to understand the scientific object of these records, and instead of seizing an excellent opportunity for adding to knowledge, they have devised a system which, while giving the doctors considerable labour, has not and will not yield results of the smallest scientific value. They have required the doctors to keep a record of every case which comes before them, and since the great bulk of insurance patients are suffering from relatively trivial affections, which often can only be defined by reference to some prominent symptom, the result is a mass of ill-defined entries without any information as to the cause, treatment, or course of the case, which is

utterly useless for scientific purposes.[1] In an actual record of 100 consecutive cases in an urban district, 'bronchitis' occurs 17 times, 'tonsillitis' 11 times, 'influenza' 7, 'muscular rheumatism' 5, 'nervous debility' 5, and 'general debility' 4 times, while other entries are 'anæmia,' 'constipation,' 'dyspepsia,' 'cephalalgia,' 'inflamed glands,' 'ulcer of leg,' 'contused eye,' 'sprained ankle,' and 'septic hand.'

It does not require scientific training to realise that no use could be made of a list of entries of this kind. It might however be said that we could at least pick out from the lists entries of graver diseases, such as cancer or tuberculosis, and use these as a basis for scientific investigation. But herein, apart from the fact that no detailed information is given, another difficulty presents itself, viz. that the Commissioners have not prescribed any uniform system of terminology to be used by the doctors. In the Registrar-General's classification of the causes of death an International List of diseases is employed, and medical men are given instructions to avoid in death-certificates various terms which are not clearly defined; but nothing of the sort has been prescribed in the insurance records. With sickness, even more than mortality, it may be possible to describe a given condition under one of several headings, hence in attempting to collate the panel doctor's records, serious error would arise owing to absence of uniformity in terminology. The system is not only wasteful and irritating, but is discouraging to those doctors who are really interested in the scientific side of their profession.[2]

Finally it may be noted that if, as appears to be the

[1] These records are now kept on cards, but at first the Commissioners issued an unwieldy and unworkable 'day-book,' which, after being distributed all over the country, was withdrawn in a few weeks.

[2] This effect is well expressed in the following extract from a letter written by a panel practitioner: "I hope I am sufficiently public-spirited willingly to do any reasonable work calculated to be of any real public or economic value, but the keeping of this enormous mass of utterly useless information, which one knows will never be used and never could be used because of its irrelevance, fills one with a sense of profound depression and wasted energy. The time and effort wasted over recording the occupation, age, sex, number, and society of every man and woman who has a headache or a stomach-ache or a cut finger or a sleepy feeling in the morning might be so much better spent either in attending to the patients' ailments or in keeping real records of genuine value."

case, some 50 per cent of insured persons consult the doctor in the course of the year, the total number of record cards sent to the Commissioners at the end of the year will amount to six or seven millions. When it is remembered that the Registrar-General and his staff are only called upon to deal with less than half-a-million death-certificates in the course of the year, the immense labour involved and the large staff necessary to collate the panel records become apparent. Even if it be desired to deal only with a single disease, every card must be examined to obtain a record applicable to the whole country. Probably long before the investigation was completed, the utter uselessness of the whole proceeding would have been realised and the cards consigned to the waste-paper basket: yet the Commissioners have inflicted substantial fines on doctors for not sending in these worthless records. It is impossible to believe that the Insurance Commissioners obtained advice from any one possessing knowledge of statistics or scientific medicine before they devised this extraordinarily inept scheme.

We may note the opportunities the Commissioners have lost. There are several conditions in regard to which information is urgently needed, and the Commissioners could have selected some of these conditions, and required the doctors to furnish full details of them, their cause, treatment, etc. (except names of patients), to the exclusion of all else. Syphilis, for example, is a disease of which our statistical knowledge is exceedingly scanty and unreliable. The importance of collecting information regarding the prevalence of this disease was emphasised by the Committee on Physical Deterioration in 1904, and subsequently in various reports of the Local Government Board and at the International Congress of Medicine in 1913. We have really no accurate information of the prevalence of this disease, and if the Commissioners had required panel doctors to record every case of syphilis, with details of its origin (congenital, acquired, marital infection, etc.), the treatment adopted, and the course of the case, much useful information regarding active syphilis among insured persons would have been available for the

purposes of the recent Royal Commission on Venereal Diseases. Another subject on which knowledge is required is the extent of abortion, natural or criminal; we are told that pre-natal loss of life is very heavy, and that artificial methods of causing abortion are widespread and increasing, but statements of the number of cases are based upon little more than guess-work. Chronic lead-poisoning might have been added to these two subjects. The Departmental Committee on the Use of Lead in Painting of Buildings point out that there are no reliable statistics relating to lead-poisoning, except among persons who come under the Factory Acts; and in their report, issued after the Insurance Act had been in operation for more than two years, they recommend that the machinery of the Act should be used for collecting this information. If a few conditions such as these had been selected for recording, it would probably have been possible to obtain the co-operation of the hospitals and thus increase the value of the records. The conditions could be changed from time to time, or different conditions examined in different localities; and if the Commissioners did not possess among themselves sufficient knowledge of Public Health science to determine what conditions should be prescribed, they could presumably have obtained advice from the Local Government Board or the Registrar-General.

If the Insurance Commissioners had focussed attention upon these three subjects, the total amount of labour demanded from the doctors in keeping records would have been far less than that required at present; the doctors would have undertaken it willingly since they would have appreciated its scientific and Public Health importance; and the knowledge gained would have been much greater than anything likely to result from the present cumbersome, inaccurate, and futile scheme.

Many other questions which have arisen under the Insurance Act are not dealt with here since they do not touch its larger Public Health aspects. Such are the solvency or otherwise of the scheme; the appalling complexity of administration; the difficulties regarding married

women; the question of arrears, the regulations concerning which extend to sixty-five sections; the confusion of the registers; and the position of deposit contributors—questions which have already entailed numerous committees and other forms of inquiry. In taking a broad view, the advantages of the Act must not be minimised. The weekly payments of sickness benefit have undoubtedly helped many poor persons through a period of distress; maternity benefit has been a substantial boon to mothers; and disablement benefit has constituted a small pension for incapacitated persons. But these benefits are all in the nature of Poor Relief under another name, and they do little to alter the conditions which bring about sickness. As far as improvement of the Public Health is concerned, the influence of the Act has probably been almost *nil*. The medical service is no better than that which preceded it, the main change being that a certain number of persons who formerly went to infirmaries and hospital out-patient departments now go to panel doctors; sanatorium treatment has proved of little value among the working classes; the provisions intended to deal with the evils of bad housing and insanitary conditions are unworkable; and the schemes for collecting Public Health information are futile, though the Research Committee will probably add to our knowledge of scientific medicine. Nearly all classes grumble at the Act, and though the panel practitioners have benefited financially, the medical profession has been split into two camps between which much bitterness exists. The Act is unsound as a scheme of Insurance, since the flat rate of contribution assumes an equality of risk which does not exist; the lower incidence of sickness in rural districts making it in effect a tax on rural industries and occupations, for the benefit of town-dwellers.

The root cause of the failures in the directions indicated is from first to last the absence of expert knowledge among the framers and administrators of the measure, and their omission to obtain expert criticism of their proposals or their disregard of this criticism when given. The Act was based upon the shallowest knowledge of the results of a similar measure in another country, where more thorough

investigation would have shown that the effects upon Public Health had been very small; it was not subjected to adequate examination during its passage through Parliament; and finally its administration in England was entrusted to a body of persons who did not include in their number any with special Public Health knowledge or experience. The War has made the importance of securing sound health among the people overwhelming. To achieve this result immense efforts are required in numerous directions. Continuation of the present system will inevitably lead to further great mistakes and pouring out of money in directions from which we shall get little or no return. If real improvement is sought, the essential first step is to place at the disposal of legislators and administrators, when dealing with Public Health, that assistance of science which is now so eagerly demanded in the spheres of commerce, industry, and education.

CHAPTER VIII

PUBLIC HEALTH AND FRAUD

Adulteration of food—Unsound food—Conditions under which food is prepared—Patent and proprietary foods—Patent and proprietary medicines—Unqualified practice.

Adulteration of Food

Adulteration of food is a serious evil in this country, but there is no means of measuring fully its injurious effects. Unsound food may cause acute illness and even death; adulteration, however, is rarely so excessive as to produce these results, but manifests its harmfulness chiefly in dyspepsia, gastro-intestinal irritation, headache, etc., and, particularly among infants and children, in malnutrition owing to the food not possessing the nutritive value with which it is credited.

It is not easy to give a picture of the extent to which adulteration is practised, since the detected instances only represent a fraction of those which occur; and because Local Authorities, Medical Officers of Health, and Inspectors of Foods find themselves obliged to allow many forms of the evil to flourish unchecked, though perfectly well aware of what is going on, owing to the faulty machinery at their command for preventing these practices. Sometimes it is the laxity or obscurity of the law which is responsible, and at other times it is the impossibility of securing the conviction of an offender before a particular magistrate. The annual reports of the Local Government Board contain much interesting information relating to adulteration and contamination of food, and from these most of the following statements concerning our principal food-stuffs are taken.

Milk.—The importance of a pure milk-supply needs no emphasis. Milk forms, or should form, one of the staple foods of all young children, while for infants it is the best substitute—if a substitute is necessary—for mother's milk. The ill-effects of cows' milk, sometimes seen in infants, are probably most often due to the fact that the milk has been adulterated, contaminated with dirt, or infected with micro-organisms. For infants whose mothers are unable to feed them naturally, a supply of pure cows' milk is of the greatest importance.

During the year 1913, in England and Wales, 52,304 samples of milk were analysed under the Sale of Food and Drugs Acts, and of these, 5533, or more than 10 per cent, were found to have been adulterated or were not up to the minimum standard fixed by the Regulations. The adulteration of milk by the addition of water is now giving way to a more ingenious process less liable to detection, which is termed 'toning.' This consists in adding to pure milk the separated milk remaining after the fat has been extracted for the manufacture of butter or cream, which would otherwise be a waste product or perhaps be used in country districts for feeding pigs. The increase of toning in London during recent years is reflected in the statistics relating to milk adulteration. Up to 1907 the rate of adulteration was always higher, and often a great deal higher, in London than in the provinces; but since that date the position has been reversed, and the adulteration returns in the metropolis have declined by 35 per cent in recent years. The Local Government Board however points out that control of the milk sent to London has passed more and more into the hands of middlemen and large companies, who are well aware of the quality of milk demanded by the Regulations, and are in a position to tone it down or standardise it by the addition of separated milk before it is distributed to the retailers. Thus there is little scope for milkmen to dilute the milk further. Adulteration is the same, but it is effected by few persons instead of many, and thus the number of convictions declines. The Board says: "We understand that as a fact "toning or standardising milk is regularly practised in

"certain quarters, and that this is done with skill and "precision, so that official limits are seldom passed. It is "most difficult under the present law to bring home any "offence to the scientific 'toner.' Whatever may be the "explanation of the difference in recent years between "London and the provinces, it is open to doubt whether "the decrease reported in the rate of London milk adultera-"tion is accompanied by any corresponding increase in the "quality of the milk-supply."

In the provinces the percentage of milk adulteration in samples taken has risen from 9·5 during the period of years 1899–1903, to 11·3 during the period 1909–13.

Facts such as these illustrate the extreme difficulty of circumventing the wiles of dishonest milk-vendors. In spite of all our Acts of Parliament, regulations, and inspections, adulteration of milk is increasing in the provinces, and its apparent decline in London is accompanied by a supply of inferior quality. There seems nothing to prevent the practice of toning spreading all over England, so that ultimately, in towns at least, it may be impossible to get anything but the poorest quality of milk.

Apart from the addition of separated milk or water, milk may be adulterated by adding to it boric acid, formaldehyde, glycerine, sodium nitrite, and colouring matter.

It is very interesting to trace the subsequent history of the 5533 samples of milk mentioned above as having been reported against during the year. In only 2418 instances were criminal proceedings taken by Local Authorities, and convictions were secured in 1767 cases, with penalties amounting in the aggregate to £4136. There were 256 fines of £5 each and upwards, fifty-three being of £10 each, fifteen between £10 and £20, nine of £20 each, four of £25, four of £30, seven of £50, and two of £100. It will be seen therefore that even if an offence is detected, the chances are still nearly three to one against a conviction being secured. Moreover the bulk of the fines are so small that dishonest vendors find it profitable to continue their practices and pay any penalties they may incur. Reporting on a milk company formed to take over the 'business of a previous company' which had been convicted more than

twenty times, the Middlesex Health Committee states that the new company had to be prosecuted during the year and was fined £70. The report continues: "It is expected that this company will shortly be succeeded in its turn by another, which will then be able if necessary to come before the Courts with a clean record." In another instance a company which had been fined £50 immediately dissolved in order to avoid payment of the penalty.

Besides deliberate adulteration, milk is liable to be contaminated with dirt or infected with micro-organisms at various stages in its passage from the cow to the consumer. The milker may be dirty in his person or his habits, the pails and cans may be imperfectly cleaned, and the milk may be polluted in transit or while stored in insanitary premises or exposed for sale in shops. Something like 10 per cent of the samples of milk examined are found to contain the bacilli of tuberculosis, and it is recognised that this is a contributory cause of abdominal tuberculosis in children.

The final result is that the milk supplied to a large proportion of children in the poorer quarters of towns is a weak, dirty, and dangerous fluid. The law is inadequate to prevent adulteration; Local Authorities have insufficient control over cowsheds, dairies, and dairymen; and the fines for adulteration inflicted by magistrates are disproportionately small. It is doubtful whether any remedy will be found for these evils, until some system of control over the milk-supply is established, analogous to that which governs the supply of water by Municipalities. Local Authorities could then own their cows and be held responsible for the cleanliness and transit of the milk from start to finish.

Cream has an even worse record than milk. Under the Public Health (Milk and Cream) Regulations, cream which is sold as 'cream' and not as 'preserved cream' must not contain any preservative; but of 1026 samples described only as 'cream' which were analysed in 1913, no less than 410 were found to contain a preservative which consisted of boric acid in all but four samples, in which

it was a fluoride. Again it is interesting to note the subsequent history. The Regulations provide that before the Local Authority institutes legal proceedings, it shall afford the person implicated an opportunity of explaining the circumstances. This procedure was followed in 263 cases, and in 239 the Authority accepted the explanation, but administered a caution in most instances. In regard to 143 cases, in which 'cream' had been found to contain boric acid, no action was taken, chiefly because the samples had been purchased without the prescribed formalities. Legal proceedings were instituted in twenty-four instances. In five cases the magistrates dismissed the summonses, in twelve they were withdrawn, and in only seven cases were convictions obtained with fines ranging from 1s. to £5.

Butter.—The samples of butter examined during the year numbered 21,932, and of these, 1131, or 5·2 per cent, were condemned. In the majority of cases margarine had been substituted for butter; in other instances there was an excess of water, or a preservative consisting of boric acid, sodium fluoride, or sugar had been added. Besides the samples condemned, there were 6866 other samples which, though passed as genuine by the analysts, contained boric acid. In all, over 33 per cent of butter samples contained preservatives. Sometimes when proceedings are taken before a magistrate for adding boric acid to food, evidence is brought to show that the small amount present would not be harmful Medical opinion by no means accepts this as established; but even if it were so, it must not be forgotten that boric acid is added to so many varieties of food that the total amount consumed may be considerable.

Margarine appears to be less subject to adulteration than butter. An ingenious method of substitution is to fill the centre of a roll of butter with margarine, the sample cut off from the end by the inspector being then found to be genuine. Incidentally it may be noted that up to 1913 the Board of Agriculture had approved of 1831 names for margarine and 44 for mixtures of butter with milk.

Other articles of food which are frequently adulterated

are flour, coffee, cocoa, sugar, confectionery, jam, rice, sago, potted meat and fish, and sausages. Of a total of 108,157 samples analysed in 1913, the number found to have been adulterated was 8860, or 8·2 per cent. The cunning of dishonest traders is illustrated by their practice, now well known to Medical Officers of Health, of selling only genuine articles to a stranger lest he may be a food inspector. This is continued until the purchaser is regarded as an ordinary regular customer, when an adulterated article will be supplied again and again. The reports of the Local Government Board every year describe numerous instances of fraudulent practices, but they never mention the names of persons convicted. This has an appearance of unnecessary concern for the protection of dishonest traders, and the establishment of a 'black list' might be a deterrent step. Medical Officers of Health have already adopted this course in certain localities.

The Sale of Food and Drugs Act, under which proceedings for adulteration are usually taken, prohibits the sale of any article of food to the prejudice of the purchaser which is not of the 'nature, substance, and quality demanded.' These words have formed a fruitful source of legal argument, and their vagueness has enabled many an offender to escape the consequences of his dishonesty. Except for milk, cream, and butter no standards in regard to the nature or quality of foods are laid down by any Acts of Parliament or regulations; and no Authority has power to prescribe standards or to state what a food should or should not contain. When criminal proceedings are taken, expert witnesses may be called by each side, scientific evidence is given, and the Bench of Justices or Stipendiary Magistrate, without any power to summon an assessor and usually without expert knowledge themselves, must come to a decision on matters involving an intimate knowledge of chemistry, physiology, and hygiene. The result is that practice varies from place to place, one Bench convicting where another would dismiss the charge, and decisions are given, some of which are not in the interests of Public Health, though we must assume them to be sound law. It has been held, for instance, that a mixture of cocoa

containing 18 per cent of the husk or shell of the cocoa nib is of the 'nature, substance, and quality' demanded when 'cocoa' is asked for, and may be sold under that name.

The uncertainty of magisterial decisions reacts upon the food inspectors, who cease to take samples when they know it will be almost impossible to obtain a conviction for an offence. Mr. R. A. Robinson, the inspector under the Food and Drugs Acts for Middlesex, writes: "There are at the present time practically only two articles of food (milk and butter) which are to any serious extent adulterated in such a way as to make it reasonably possible to institute proceedings successfully. . . . I do not feel, save in very exceptional cases, that I can usefully advise proceedings to be instituted in respect of any of the following among a host of other articles—cream, vinegar, jams, golden syrup, treacle, aerated waters, rice, preserved vegetables, tinned fruits, chocolate, lime juice, sausages, potted meats, wines, and various drugs." [1]

Unsound Food

Apart from adulteration, food may be unfit for human consumption from the presence of disease in the animal, or from decomposition, the danger attending the latter being far greater with animal than vegetable food. Diseased or unsound meat may be seized by a Medical Officer of Health or Sanitary Inspector when exposed for sale or deposited in any place for the purpose of sale, and the meat is then submitted to a magistrate, who has power to order its destruction. In many districts where the inspectors are vigilant, their powers seem to be sufficient to prevent the sale of unsound meat, but in this matter also, different standards of meat inspection exist in contiguous districts and give rise to many anomalies. The Local Government Board has repeatedly called attention to the need of a uniform system throughout the country. One effect of the differences in standard is that diseased animals or unsound meat are transferred from districts

[1] *Transactions of Medico-Legal Society*, vol. vii.

where inspection is severe to districts where it is lax, and sold therein. The following example of this practice is quoted from a medical officer's annual report in the Local Government Board Report for 1913–14 :—

I received information that a beast which was very emaciated had been slaughtered on unlicensed premises early in the morning and was being conveyed into the town. As my information was very imperfect, I had some difficulty in tracing the matter. After instituting inquiries I visited some stables but found them locked. The occupier, who saw me enter the yard, had disappeared when I came out to require admission to the stables. I accordingly set a trap for him, and as a result I found him hiding in a lane near. Upon seeing me he ran away. I caught him, and on gaining admission to the stables I found the hide, but not the carcase. The occupier, in reply to my question, said it had gone to the knacker's yard. To satisfy myself that the carcase had not gone for human food, I proceeded to the only two yards within some miles of the town and found that this information was untrue. A few days later I received information from which there was very little doubt that the carcase had gone for human food to a district a few miles away, and it is very probable that the carcase was affected with some organic disease.

The difficulties of dealing with this illicit meat traffic are very great, and necessitate long watching of the class of persons who deal in 'slink' meat.

The reports of the Local Government Board contain numerous examples of the trade in unsound meat on a large scale. A co-operative society was found to be in possession of nearly 1½ tons of offensively-smelling and tainted meat on premises where the manufacture of sausages was proceeding. The evidence revealed a particularly disgusting condition of things, and the magistrates inflicted a fine of £20, with £10 : 10s. costs. A meat-vendor who sold unsound meat habitually was warned by the Sanitary Authority. The warning did not however act as a deterrent ; he was again detected in the act of selling such meat to different customers, and on proceedings being taken was fined £15 and £2 : 2s. costs. The Local Government Board speaks of this as a 'substantial' penalty, but the consumers of the meat might take a different view ; they might think that a term of imprisonment would not have been amiss, and they might ask why the offender

was permitted to escape in the earlier instances simply with "a warning."

When we recall that during the War one of the largest firms of caterers in the country has been fined the maximum amount for supplying unsound meat to the troops, the magistrate expressing the opinion that the negligence involved not only the employees, but also the managers of the firm; and that another large company was fined the maximum amount for supplying adulterated butter to troops, we see that patriotism weighs as little with dishonest traders as concern for Public Health.

Meat is not the only article over which it is necessary to exercise vigilance. A manufacturer for instance was found deliberately using unsound jam, fat, and other articles in the preparation of confectionery. He is described as a 'wholesale and retail baker in a large way of business,' and was fined £15 and £2 : 2s. costs.

When unsound food is submitted to a magistrate, the question for determination is whether it is fit for human consumption or not. Usually magistrates recognise the danger of unsound food and take a severe view of offences. Sometimes, however, their decisions are contrary to expert opinion and opposed to the public interest, an interesting example of which has been described in a circular issued by the Medical Officer of Health for Bermondsey. In June 1915 the Wharves and Food Inspector found eighty-two casks of imported butter rancid and unfit for human consumption. This opinion was confirmed by the Medical Officer of Health and the Public Analyst, who had found 3·16 per cent of free fatty acids present, the normal amount in fresh butter being well under ·5 per cent. A prosecution was instituted, and for the defence it was urged that, while the butter was not fit to be sold over the counter, it could be used for making cakes and confectionery, in which its rancid taste and smell would be disguised by other flavourings. After examining the butter the magistrate decided that it was fit for human consumption, and the casks were released.

It appears, therefore, that while a vendor may be summoned for having 1 per cent of water in his butter

above the prescribed standard, he may have more than 3 per cent of free fatty acids without committing an offence. The Medical Officer of Health for Bermondsey has declared that the War Office, Boards of Guardians, and other public authorities would refuse to accept such butter; and only the general public fails to secure protection against food-stuffs made of impure or unsound materials whose rottenness is concealed by other flavourings.

A case described in the report of the Local Government Board for Scotland for 1914 illustrates another way in which legal decisions may be opposed to the public interests. The carcase of a cow killed in the public slaughter-house of a burgh in the north of Scotland was found to be tuberculous throughout. The veterinary surgeon condemned it, the owner of the carcase admitted that it was the 'worst case of the kind' he had ever seen, and orders were given that it should be buried. Nevertheless the owner removed the meat from the slaughter-house and distributed it in various directions throughout the community. After legal proceedings involving the butcher, the veterinary surgeon, the Town Clerk, the Chief Constable, the Local Authority, and the Procurator-Fiscal, the matter was eventually referred to the Crown Office, who gave their opinion that there was a reasonable chance of securing a conviction against the butcher for obstructing the Local Authority or Sanitary Inspector from carrying out their duties. Accordingly a prosecution was instituted by the Procurator-Fiscal in the Sheriff Court, where it was decided that removal of portions of a carcase while it was only *liable to be seized* and had not been actually carried away, did not amount to obstruction in terms of Section 163 of the Public Health Act.

A pleasing practice described in the same report is that of 'blowing' meat, which was formerly done by the mouth, but is now effected by a machine. Air is blown into the tissues which gives a false appearance of plumpness to the meat. Besides being a direct fraud, the practice alters the appearance of the meat so as to increase the difficulty of detecting disease, and increases the danger of contamination by dirt, dust, and micro-organisms.

Conditions under which Food is prepared

The work of the Local Government Board in connection with inspection of food to be used by troops has brought to light another weakness in the scheme for protecting the food of the community. Under ordinary circumstances the power of Sanitary Authorities to inspect and control the conditions under which food is prepared is very limited. The War Office however when making contracts for the supply of food, requires that the food shall be prepared under hygienic conditions; and this stipulation has given the food inspectors opportunities of observing conditions which were previously denied to them. While, speaking generally, the quality of the materials used in the preparation of food for the troops has been found to be good, the inspectors have had on many occasions to take exception to the conditions under which it was being prepared. To quote the Local Government Board Report: "While the conditions found in some "of the principal food-preparing places concerned were "quite satisfactory, many instances have been met with in "which manufacturers have not seen or appreciated the "necessity of observing ordinary rules of cleanliness in all "operations connected with food preparation. It has "been quite common to find foods being prepared in rooms "littered with dirty rubbish, benches frequently have been "dirty and loaded with grease, and floors and walls cracked "and uneven, thus harbouring dirt. The state of personal "cleanliness of the workers, also, frequently has left much "to be desired. Aprons and overalls, if worn at all, were "often filthy, and in some instances old and dirty sacking "was considered good enough for the work-people to wear "over their own clothes. . . . As has already been indi-"cated, action in such cases has been possible only through "officials being in position to enforce War Office require-"ments, and it is to be feared that the improved standards "of cleanliness which have been secured will not be main-"tained by many of the firms when they are no longer "engaged on War Department work."

If these were the conditions found in the premises of

firms which had agreed to observe hygienic surroundings, and knew they were liable to inspection, it may be inferred that the conditions are worse in places for preparing food which are not under stipulation or control. The probability is that if we could see the dirt and adulterants in much of our food, there is very little that we should care to eat. Let any one who buys a glass of milk in a tea-shop imagine what it would look like if it had been water, and had gone through the processes and journeyings through which the milk has passed. Part of this is due, as the Local Government Board points out, to sheer ignorance of what constitute cleanly conditions. The shopkeeper takes care to protect dainty fabrics from dust and dirt by keeping them behind glass windows, but it is common to see butter, ham, and other articles of food intended to be eaten as they are, quite uncovered in shops which are anything but clean, or even exposed for sale outside in crowded and dirty streets, where particles from horse droppings and other filth in the roads may be blown upon them by every gust of wind. The costers' barrows, with their plates of shell-fish, or slushy mess sometimes termed 'fresh-picked strawberries,' are even worse. Inside some of the best shops and large stores we find pastries and sweets laid out on a counter by the side of which a throng of customers continually passes. These conditions are not necessary, but so far as the writer knows there is only one large shop in London which keeps and displays its food-stuffs under really hygienic conditions. We hear a great deal nowadays about the necessity of educating mothers, but it is certain that some of this effort might with advantage be directed towards educating not only vendors of food-stuffs but also the general public, who are apparently quite satisfied to have their food prepared and sold under the conditions described.

Patent and Proprietary Foods

These widely-sold foods are objectionable mainly in consequence of the extravagant claims which are made for their value, and their unsuitability for the purposes for

which they are advertised. Artificial foods for infants are probably the most pernicious. As shown by the analyses made by Mr. Julian Baker and Dr. Coutts for the Local Government Board,[1] a large proportion of these foods contain high percentages of starch; in many the starch exists in practically an unchanged condition; and the majority contain a very low percentage of fats. Such foods are unsuitable for young infants, and may cause serious illness; nevertheless they are boomed by advertisements which are often little short of fraudulent. Pictures of Gargantuan babies fed on the food are pasted on the hoardings, and mothers are assured that only by taking the food will their children thrive. Condensed milks, containing a large proportion of cane-sugar and very little fat, are belauded to credulous women as entirely satisfactory substitutes for mothers' milk. Thus, while Public Health and Education Authorities are doing all they can to encourage breast-feeding, vendors of infants' foods and milks are allowed largely to nullify these efforts by spreading broadcast their unwarranted claims. In France, the Roussel law prohibits the administration of any solid food to infants under the age of twelve months without the express direction of a medical man. In Australia a regulation is general which demands that starch-containing foods shall bear a label with the words, 'Not suitable for infants under the age of six months'; but in this country no such safeguards exist.[2]

A further objection to these foods is their cost, which is generally out of all proportion to their value, a packet containing perhaps two pennyworth of flour being sold for a shilling or more. The poor are thus paying for the excessive advertising, with money which might be much better spent in buying natural food.

Of proprietary foods for adults, probably those which are pushed with the most misleading statements are various meat extracts, often advertised with pictures of lusty oxen or Highland cattle. These substances consist

[1] *Food Reports*, No. 20.

[2] See "Proprietary Foods in Infant Feeding," by Hector Charles Cameron, M.D., *Brit. Med. Journ.*, Aug. 21, 1915.

of the salts, flavouring material, etc., of meat, but do not contain any meat fibre, albumin, or fat, though in some preparations small quantities of these are added to give the extract a certain food value. When made into solution with warm water they serve on appropriate occasions as useful stimulants, and perhaps do some good by lessening the sale of alcohol, but their food value is very small, and they produce neither heat nor energy. Nevertheless the public are led to believe that they are valuable and sustaining foods; and during recent months they have been widely advertised as enabling munition workers to endure heavy toil, and as the best present for soldiers in the trenches.

No one would propose to prevent the trade in proprietary foods, but there seems little reason why advertisements of such foods should not be submitted before publication to a central Public Health authority, which should have power to delete any claims not in accordance with fact.

Patent and Proprietary Medicines

The whole question of the sale of patent and proprietary medicines has recently been investigated exhaustively by a Select Committee which issued its report in 1914, a report which is probably unequalled among Government publications as an exposure of commercial fraud, legislative muddle, and shameless exploitation of credulity and ignorance.

The trade in proprietary remedies is very large and increasing, the receipts for medicine stamp duty having risen from £327,857 in 1912, and £328,319 in 1913, to £360,377 in 1914, a much larger increase than in any previous year, which suggests that the Insurance Act, owing to the importance attached in that measure to drugs, has actually stimulated the trade, despite the fact that insured persons now get medicines free from the doctors. The number of medicine duty stamps issued during the year ending March 31, 1914, was 44,427,166, estimated to represent sales exceeding the value of

£3,200,000, and this is exclusive of large classes of medicines which, for various reasons, are not required to pay duty. Figures for individual businesses indicate the magnitude of the trade. The daily sale of a well-known pill amounts to more than a million; the proprietors of a certain syrup pay upwards of £40,000 a year in wages only; and several owners of much-advertised remedies have left fortunes exceeding £1,000,000. Enormous sums are spent on advertising. The proprietors of a 'medicated' wine spend £50,000 a year for this purpose, and a well-known swindler, now deceased, is believed to have spent £20,000 a year in advertising an alcohol cure. The London Chamber of Commerce estimates that £2,000,000 is spent annually in this country on advertisements of proprietary medicines.

The sale of secret remedies undoubtedly constitutes a grave and widespread public evil. Some of them contain powerful and dangerous drugs, which should only be taken on a doctor's prescription, and the so-called 'soothing powders' may be particularly harmful to children. A much larger number, however, contain some common drug, very frequently a purgative, with colouring and flavouring agents; or consist of dilute solutions of substances possessing no medicinal value—at least in the amounts given—such as glycerine, citric acid, sulphurous acid, and sodium bicarbonate, flavoured with capsicum, peppermint, cinnamon, etc. These are sold with grossly fraudulent claims of their power of curing disease, at prices which are often several hundred times the cost of manufacture. Cures for consumption, diabetes, paralysis, locomotor ataxy, Bright's disease, lupus, fits, epilepsy, rupture, deafness, diseases of the eye are advertised with stories of the discovery of a rare root in Central Africa, or of a philanthropic clergyman who was profoundly impressed by the death of his young wife, etc. A "well-known London surgeon" promises a cure for cancer by natural means without operation, and supports his claim by testimony "from medical men in all parts of the world." Advertisements are accompanied by garbled extracts from the writings of deceased physicians of eminence, and by

testimonials from persons in all ranks of society, many of which are quite genuine, but have clearly emanated from those unable to distinguish between *post hoc* and *propter hoc*. Sometimes puffs are inserted in the ordinary columns of the journals as items of interesting news. The result is that many thousands of ignorant persons buy these remedies when ill; and if suffering from a serious disease, may postpone seeking skilled medical advice until grave harm has been done or a fatal termination is inevitable. Persons with early tuberculosis have recourse to 'lung tonics,' and many a woman suffering from cancer of the breast has allowed the opportunity for a permanent cure to pass, while she has been applying inert ointments, or causing ulceration by using a caustic paste to destroy the 'roots' of the growth. The habit of taking drugs becomes established, and many persons continually purchase 'blood purifiers,' 'uric acid solvents,' 'kidney pills,' 'headache cures,' and other nostrums. The waste of money in the purchase of these drugs by the working classes is very large. An inquiry made in 1909–1911 by the Board of Trade into the weekly personal expenditure of a number of wage-earning women and girls, showed that more than five times as much was paid to chemists as to doctors. The condition and complaints of these girls are indicated by the titles of the drugs purchased. 'Blaud's pills,' 'soda-mint tablets,' 'throat pastilles,' and 'camphorated oil' occur again and again, and tell a weary tale of struggle against ill-health.

A particularly pernicious form is the sale of preparations purporting to produce abortion. These are largely advertised, for some curious reason or other, in some of the Sunday journals, with statements which but thinly disguise their object. They are warranted to remove the "most stubborn cases of obstruction and irregularity," and are a "safe, certain, and speedy remedy," but are "on no account to be taken by ladies wishing to become mothers." Sometimes the revenue stamp which must be affixed to the box is cunningly represented as a guarantee: "My female specifics are Government stamped, without which they are a forgery." Such preparations are sold

in various ' strengths,' the ' extra strong ' running up to 20s. a box, but the difference in the qualities does not extend farther than the label and the price. Most of these substances are inert and harmless, but some of them contain powerful drugs or strong purgatives which, if taken in large quantities, may cause serious illness. During recent years the practice of taking pills made of diachylon plaster or other compounds of lead has become frequent, and has led to numerous grave and even fatal cases of chronic lead-poisoning. The practice originated in the Midlands, and is now spreading to other parts of the country. The knowledge is conveyed from mother to mother, and some midwives of an inferior type appear also to be responsible. Many of the women who take these preparations are unaware of their dangerous properties, or even of the fact that they contain lead.

Mischief is also done by the sale of ' medicated ' wines, many of which contain from 15 to 20 per cent or more of alcohol, and can be readily purchased from chemists and grocers. The report of the Select Committee says: " There can be no doubt that many persons acquire the " ' drink habit ' by taking these wines and preparations, " either knowing that they are alcoholic, since they can be " purchased and consumed without giving rise to a charge " of ' drinking,' or in ignorance that they are highly in- " toxicating liquors." Some of these preparations are not even called wine, such names as ' liquid peptonoids,' or ' nutritive elixir,' concealing all suggestion of the fact that they contain alcohol.[1] A trifling amount of meat extract is added to some wines, which are then claimed to be nutritive. One well-known preparation is advertised as giving " a strength that is lasting because in each wine-glassful there is a standard amount of nutriment," and another is described as " the world's greatest tonic, restorative blood-maker, and nerve food." The pictures of languid invalids reclining on couches while doctor or nurse hands them a glass of one of these alcoholic concoctions are among the most objectionable of advertisements.

[1] Quite recent regulations now require the amount of alcohol in patent preparations, etc., to be stated on the label.

Some medicated wines contain cocaine, and there is reason to believe that the habit of taking this drug, which had recently assumed serious proportions in Paris, is now increasing in this country.

Great difficulty exists in exposing to the public the fraudulence of this trade, owing to the reluctance of the newspapers to publish anything which reflects on the value or efficiency of secret remedies. It is estimated that a sum of more than £2,000,000 a year is spent upon advertisements in the Press, and most newspapers draw a considerable proportion of their income from this source, while a number of small provincial newspapers probably could not exist without their advertisements of secret remedies. The Select Committee point out that when the British Medical Association issued its volume entitled *Secret Remedies*, containing analyses, costs, etc., of a large number of proprietary medicines, not only was the volume not noticed editorially by most papers, but even advertisements were declined by many journals, some of them of the highest class. They also say: "A trial in Edinburgh, "in the course of which the judge described the business of "the proprietors of 'Bile Beans' as based on unblushing "falsehood for the purpose of defrauding the public, was, "we were informed, with few exceptions not reported in "the Press, and the remedy still has a considerable sale." Even the medical Press is not entirely free from blame; and one medical journal, which claims to have a considerable circulation though it would not be recognised as one of the leading organs, mixes with its letterpress scarcely distinguishable puffs of patent medicines and illustrations of appliances to prevent conception.

The law relating to the sale of patent and proprietary medicines and its administration are described by the Select Committee as 'chaotic.' The Statutes begin from 1804, and are numerous, overlapping, and sometimes inconsistent; the administration touches the Privy Council, the Home Office, the Local Government Board, the Patent Office, and the Board of Customs and Excise. Many curious anomalies exist. 'Cough mixture,' 'liver tonic,' and 'headache powder' are dutiable, but 'chest mix-

ture,' 'liver mixture' and 'head powder' are not. Smelling-salts pay duty, but asthma cigarettes do not. Identically the same substance is sold under a great variety of names, but if asked for under one name the chemist may not sell it under another. Almost the whole of this mass of law and administration exists, not for the purpose of protecting the public, but for the object of adding a relatively small sum to the revenue. There is no Department of State nor public officer charged with the duty of controlling the sale and advertisement of secret remedies in the interests of Public Health; the Home Office and the Local Government Board are virtually powerless in this respect; and the powers of the Privy Council are practically restricted to scheduling powerful poisons.

The Select Committee on Patent Medicines considered that legislation was urgently needed, and made a number of recommendations, which included control of the sale of patent and secret medicines by a Ministry of Health when that should be created, and meanwhile by the Local Government Board. The outbreak of war is perhaps sufficient reason why no action has been taken, but as the question pertains to no special Department, it will probably provide another instance of those matters which are put aside year after year, simply because it is no one's business to be concerned with them.

Unqualified Practice

In this country any person, however ignorant, may undertake the treatment of disease. The law of medical registration does not do, and does not purport to do, more than provide a means whereby the public can distinguish between persons professing medicine who are registered and recognised by law in virtue of their having undergone a specified medical training and passed certain examinations, and others who have had no such training or examination. Medical treatment is far older than medical law, and it is not probable that the community will ever restrict the practice of medicine exclusively to a

professional class. Nor, indeed, would the medical profession ask for this; medicine has still much to discover; and doctors are not infallible, and they would not be justified in demanding that the sick should be prohibited from seeking assistance from any but those who have gone through the prescribed training. But while practice by unregistered persons must be permitted, there is no reason why it should be associated with grave abuses. The community is justified in taking steps to protect the ignorant and credulous from false claims and fraudulent practices of unregistered persons; while the doctors are entitled to ask that the distinction which the law has sought to make should be real, that their titles should not be usurped by unregistered persons, and that only registered doctors should be recognised by the State for official purposes.

The Medical Act of 1858, which governs the use of medical titles, prohibits a person from wilfully and falsely using the title of Physician, Surgeon, etc., or any title or description *implying that he is registered under this Act or that he is recognised by law* as a Physician, Surgeon, etc. At first sight this section would appear to afford ample protection to registered medical men, but the words in italics have given rise to much dispute, and successive legal decisions have so reduced their application that now the spirit of the section, if not the letter, may be violated with impunity. Any person may call himself 'doctor,' since this has been held not to imply that he is registered; and may publish circulars and advertisements relating to medical matters, from which the public is clearly intended to infer that he is a doctor of medicine. 'Dr.' Macaura, 'Dr.' Bodie, and 'Dr.' Crippen afford instances of the use of this title. And with regard to the use of letters after the name, while 'M.D.' alone is held to be an infringement of the Act, any one may add 'M.D., U.S.A.,' though if this is meant to imply 'United States of America,' there is of course no university of that name. The result is that a large number of ignorant persons, even if they are aware that the person they consult is unregistered, believe that he is qualified in some special

way to give medical or surgical advice. The medical profession, too, have a legitimate grievance in that their privileges are infringed. By law, only a registered medical man can give a certificate of death, but until quite recent years registrars were empowered to accept from other persons 'information' concerning a death which amounted to a death certificate in all but name. Under the regulations made by the Insurance Commissioners, insured persons may be medically treated by unregistered persons, though there is nothing in the Act to justify this course, and the Royal Colleges have protested strongly against it.[1] The Commissioners have, however, considered themselves bound by a verbal promise which was given in the House of Commons, but was not embodied in the Act.

Some unregistered persons pose as qualified medical men, and treat all classes of diseases, or claim to be specialists in the treatment of cancer, consumption, venereal diseases, affections of the eye or deafness. Others, such as herbalists, bone-setters, and faith-healers, boldly distinguish themselves from medical men, and claim that their methods of treatment are superior, since they are not bound by the traditions of orthodoxy. Much prescribing and treatment of minor illness is also done by chemists. That great harm is done by these persons has been shown again and again. The report of the Inquiry into Unqualified Practice, made by the Privy Council in response to an appeal from the General Medical Council, gives numerous examples of grave and even fatal results due to ignorant treatment, and other instances have appeared in the public Press. Sometimes errors of diagnosis are made, but frequently there is no question that the patient is suffering from cancer, diabetes, consumption, or other deadly disease; nevertheless he is persuaded to undergo a course of treatment which involves the purchase of quantities of costly drugs or instruments. Though all the

[1] The following resolution was passed by the Royal College of Physicians in 1914: "Hitherto none but duly qualified medical practitioners have been employed, as such, in any public capacity; and the College deplores that under an Act professing to promote the health of the nation, recognition should be given and provision made for the payment of public money to a class of persons who have not obtained a legal qualification to practise medicine, and concerning whose medical knowledge there exists no sort of guarantee."

time steadily getting worse, the patient is assured that he is rapidly improving, and tricks are played to convince him of the fact. In one instance portions of pig's entrails were shown to a woman to convince her that the cancer had come away from her breast. Sometimes the quack will continue to suck his victim like a vampire until death releases him from his clutches, but more often, having gone as far as he dare, he will let the sufferer pass under the care of a qualified practitioner in order that there may be no difficulty about the death certificate.

A pernicious class consists of those who undertake the treatment of venereal diseases. According to the above-mentioned report, the treatment of venereal diseases in many large towns is to a considerable extent in the hands of unqualified persons. Chemists and herbalists frequently undertake the work, and the number of so-called specialists in venereal diseases appears to be increasing. The opportunity for these practitioners is very great, owing to the fear of many sufferers of their condition becoming known, and their reluctance to consult their family doctor. These persons advertise a rapid and painless cure for all sexual ailments, 'loss of virility,' etc., with testimonials and hours of attendance. Sometimes they give instructions for the sufferer to make his own diagnosis, and describe perfectly natural phenomena as evidence of disease. They will even undertake to examine secretions. In one case the police, under an assumed name, sent to a man who advertised that he was principal of the 'British Health Institute,' a bottle of fluid consisting of tea, soap, and colouring matter, and received a reply that he was suffering from internal catarrh, but was assured that: "I have every confidence that by following my treatment you should soon derive very considerable benefit." One medicament found on the premises of the 'Institute' consisted of salt coloured pink with aniline dye. The influence of these practices upon Public Health is very injurious. The Royal Commission on Venereal Diseases say: "We have "no hesitation in stating that the effects of unqualified "practice in regard to venereal diseases are disastrous, and "that, in our opinion, the continued existence of unqualified

" practice constitutes one of the principal hindrances to the " eradication of those diseases." As we have seen, action has now been taken to provide skilled treatment.

Abortion-mongers are obliged largely to carry on their trade in secret, though they may advertise ' female remedies,' and they frequently associate the sale of Malthusian appliances with their business. In addition to the immense trade in pills, etc., there is no doubt that a great deal of instrumental interference is performed, particularly in the Midlands and northern counties. The cases which come to light owing to the death of the woman and the holding of a coroner's inquest, represent only a small fraction of the operations actually performed. Many abortionists now exercise a considerable degree of skill in their manipulations; they are aware of the dangers, have some knowledge of anatomy, and employ antiseptics, thus substantially reducing the risk of a fatal termination, though their efforts may be followed by serious illness, and perhaps permanent ill-health. Much interesting information relating to abortionists will be found in an article, " Criminal Abortion and Abortifacients," by Dr. W. F. J. Whitley, in *Public Health* of February 1915.

Another type of bogus doctor relies more upon appealing to a whole class than to individual patients, and makes his profit by the sale of some appliance—an ' electric ' belt, a ' vibrator,' or an ear-drum. These things may be advertised in the Press, but often in addition the proprietor travels round the country, widely advertises his visit to a town, and holds huge meetings, at which a pretence is made of examining patients then and there, and numbers of the appliances are sold. One of these quacks, after holding meetings which filled the Albert Hall, not satisfied with his gains in this country, started his practices in Paris, where, under a sterner law, he was promptly arrested and sentenced to imprisonment. These appliances are bought by the more ignorant members of the community, and in many an agricultural labourer's cottage a vibrator or a useless ear instrument will be found, perhaps purchased for several guineas out of wages of 14s. a week.

CHAPTER IX

THE COMPLEXITY OF PUBLIC HEALTH ADMINISTRATION

Central administrative authorities—Local administrative authorities—The evolution of the Public Health services—Administration of sanatorium benefit—Administrative authorities and statistics—The discouragement of the present system.

THE Public Health services in this country are administered centrally by nearly a dozen independent and uncoördinated Departments, Boards, and Councils ; and locally by nearly as many local authorities. Before examining the growth and effects of this system it may be useful to give a list of the authorities concerned.

CENTRAL ADMINISTRATIVE AUTHORITIES

The Local Government Board.—This office contains two separate and distinct medical departments, one for Poor Law and the other for general Public Health purposes. The Chief Medical Inspector for Poor Law purposes exercises control over the medical activities of Boards of Guardians, and is concerned with the central administration of the vaccination laws. The Chief Medical Officer to the Board advises on the issue of orders and instruction to Local Sanitary Authorities on Public Health matters, such as drainage, sanatoria, and maternity centres ; is responsible for special medical inspection in relation to infectious diseases and epidemics, defective housing, adulteration of food, etc. ; and conducts or arranges for scientific investigation in matters of hygiene.

The General Register Office addresses its annual report to the President of the Local Government Board, but other-

wise seems to have no connection with that Department. It compiles the national vital statistics, and issues the annual report on Births, Deaths, and Marriages, which every year contains a valuable dissertation on the distribution and principal causes of deaths.

The Home Office supervises sanitary conditions in factories; controls dangerous trades; has duties in connection with the Mental Deficiency Act; and is concerned with the prison medical service and inebriety. This Office also appoints Medical Referees and Certifying Factory Surgeons under the Workmen's Compensation Act.

The Board of Education administers the Acts for the medical inspection and treatment of school children, and controls grants in aid of schools for mothers for instruction in infant care and welfare.

The Treasury—though without a medical adviser—exercises important Public Health duties under the National Insurance Act. It determines whether extra expenditure upon medical benefit is reasonable or not; gives its sanction before certain exceptional expenditure upon sanatorium benefit is incurred; and has a controlling voice in determining what diseases other than tuberculosis shall be medically treated under sanatorium benefit.

The National Insurance Commission administers the Insurance Act. There is a separate Commission for each of the four divisions of the United Kingdom, which are more or less brought into coördination by a fifth body, the *Joint Committee.*

The Privy Council has duties in connection with the General Medical Council, the Central Midwives Board, and the Pharmaceutical Society. As an example of the Privy Council's activities in Public Health, reference may be made to the report it issued in 1910 on the "Practice of Medicine and Surgery by Unqualified Persons in the United Kingdom," though the information upon which the report was based was collected vicariously through the Local Government Board.

The Board of Trade appoints medical inspectors to examine seamen in ports; has duties in connection with

sickness among emigrants; and looks after the health of crews in certain particulars. It is of great interest to note that the Board has issued a book, the *Ship Captain's Medical Guide*, which all merchant ships must carry, and which contains instructions on the prophylactic measures against venereal disease referred to in an earlier chapter; and that since 1911 it has been supplying merchant ships with the medicaments necessary for this purpose.[1] Thus the Board of Trade is conveying to seamen, and indirectly to the general public, knowledge of preventive methods which are ignored completely in the report of the Royal Commission on Venereal Diseases, and in the reports on Public Health of the Local Government Board.

The Board of Agriculture prescribes, or may prescribe, the standards for milk, cream, butter and cheese; issues the 'Sale of Milk Regulations'; and has power to inspect and register premises for milk-blending and margarine-making.

The Colonial Office investigates or assists investigations of tropical diseases, and publishes reports thereon. The *Board of Customs and Excise* has duties in connection with the sale of patent and proprietary foods and remedies.

The preceding authorities are Government Departments, and are not concerned exclusively with Public Health. In addition the following central authorities discharge important duties in connection with Public Health:—

The Board of Control, through the Commissioners in Lunacy, exercises general control over the supervision and protection of mentally defective persons, and the management of lunatic asylums, and appoints guardians and visitors of certified lunatics.

The Ministry of Pensions exercises various functions in connection with the care and training of disabled soldiers.

The General Medical Council keeps the register of medical practitioners, superintends the standard of examinations for medical qualifications, and exercises

[1] See the evidence of Dr. Burland and Mr. Shepherd before the Royal Commission on Venereal Diseases. *Appendix to Final Report*, vol. ii.

disciplinary control over the medical profession in professional matters. This body also publishes the *British Pharmacopœia*, the volume which prescribes the standard strengths of drugs and the usual doses for administration, a new edition of which has just appeared after a lapse of fifteen years.

The Central Midwives Board maintains the register of midwives, lays down regulations for their conduct of cases, and conducts examinations in midwifery for midwives.

The Pharmaceutical Society examines and registers chemists under the Pharmacy Acts, and advises the Privy Council on the control of the sale of poisons.

The preceding are all statutory authorities for England, and most of them have their counterparts in Scotland and Ireland. But the list by no means exhausts the bodies which do in fact influence Public Health affairs. Large and active Societies, such as those for the prevention of tuberculosis, venereal diseases, infant mortality, inebriety, etc. etc., investigate Public Health questions, issue reports which help to form public opinion, and are sometimes the means of securing the appointment of Royal Commissions, and of initiating legislation. To these must be added the large charitable organisations, such as King Edward's Hospital Fund and other hospital funds, the Charity Organisation Society, maternity charities, nursing associations, social service leagues, etc., which annually disburse sums amounting to several millions in the interests of Public Health.

Local Administrative Authorities

In local administration we find a similar multiplicity of authorities, the principal bodies engaged in Public Health work being the following :—

The Local Sanitary Authority.—In County Boroughs this is the Borough Council. In Urban and Rural Districts it is the Urban or Rural District Council, though certain duties are discharged for the County as a whole (exclusive of the County Boroughs) by the County Council. The chief Public Health duties of a Local Sanitary Authority

are connected with infectious diseases, tuberculosis, housing, scavenging, drainage, adulteration of food, meat inspection, milk supply, health visiting, etc. These are carried out under the advice of the Medical Officer of Health who is assisted by a staff of inspectors and health visitors.

The Board of Guardians maintains infirmaries for sick paupers; provides outdoor medical relief through a staff of Poor Law Medical Officers; and undertakes public vaccination.

The Insurance Committee administers medical benefit under the Insurance Act, but must consult or act in conjunction with a number of other bodies, such as the *Medical Benefit Sub-Committee*, the *Local Medical Committee*, the *Panel Committee*, and the *Pharmaceutical Committee*. Sanatorium benefit is administered by a combination of the Insurance Committee and Local Authority, which has led to endless confusion and delay. Sickness and maternity benefit are administered by *Approved Societies*, except for deposit contributors, who come under the Insurance Committee.

The Local Education Authority, which is the Local Authority acting through the Education Committee, provides for the medical inspection and to some extent for the treatment of school children, and has duties in connection with schools for mothers.

The Coroner inquires into deaths from unnatural causes. His inquests upon deaths from accidents in factories, etc., poisoning by trade processes, neglect, and other preventable causes are important from the Public Health point of view, and the accuracy of his investigations has an appreciable effect on the national vital statistics, since more than 10 per cent of all deaths come under the purview of coroners.

The Magistrates and Justices are in effect in some of their duties Public Health officers, for they may be called upon to determine complex questions in relation to adulteration of food or condemnation of meat or standards of milk, and whether food is prejudicial to health or is of the nature and quality demanded.

Besides the statutory authorities enumerated, Hospitals,

Provident Dispensaries, Care Committees, District Nurses, Guilds of Health, and other private agencies are all engaged locally in important Public Health work.

In London, administration is further complicated by the division of power between the *London County Council* and the twenty-eight *Metropolitan Boroughs* and the *Corporation of the City*. Other authorities peculiar to London or its vicinity are the *Metropolitan Asylums Board*; the *Metropolitan Water Board*, which is responsible for the maintenance and purity of the water-supply, though the *Thames Conservancy Commission* exercises powers to prevent pollution of the river; and the *Port of London Sanitary Authority*, a department of the Corporation of the City which supervises the sanitary condition of shipping and the Port of London generally.

The Evolution of the Public Health Services

This multiplicity of authorities is a result of the piecemeal way in which Public Health affairs have been dealt with in this country. Except for the general sanitary services, we have never provided for the needs of the country as a whole, but only for isolated groups, paupers school children, insured persons, etc.; and—except for a brief interval in the middle of the nineteenth century—we have never had one central authority definitely charged with the protection of Public Health without other duties. As each new Act has been passed, its administration has been either thrust upon an existing Department, perhaps created originally for quite other purposes, or has been assigned to a new authority created *ad hoc*. We may learn several lessons by noticing some instances of these processes.

The original object of the Poor Laws was mainly the repression of crime and vagrancy. The Statutes of Elizabeth and enactments up to the eighteenth century refer again and again to "rogues, vagabonds, and sturdy beggars"; and such persons might be whipped, branded, set in the stocks, or even hanged. The harsher laws were only gradually replaced by more humane legislation, and

the Poor Law authorities slowly assumed their important function of providing for the sick and infirm poor. Poor Law Unions and Boards of Guardians were created by the Act of 1834, and later years saw the growth of the infirmary system and other forms of medical relief. How completely the Poor Laws have changed their character since the days when they existed mainly for the suppression of vagrancy, may be realised from an analysis of the 762,196 persons in receipt of relief on January 1, 1915. Of these 415,449, or 54·5 per cent, were definitely suffering from sickness, accident or mental or bodily infirmity, and 223,062 others were children. The remainder included persons over seventy years of age, persons relieved on account of sickness or infirmity of wife or child, persons weak or feeble from premature senility or other circumstances, widows, wives living apart from their husbands, etc. The class who were, broadly speaking, in health and free from mental infirmity, but were more or less inefficient, numbered less than 20,000.

The Poor Law system, with its great infirmaries scattered all over the country, is in fact our largest public provision of medical treatment and care for the poorer classes, particularly for those suffering from chronic illness or permanent incapacity. It is therefore much to be regretted that a prejudice exists among the working classes against accepting this form of assistance, a prejudice which is undoubtedly inherited from the time when the Poor Laws were so closely associated with the repression of crime and vagrancy. This hostile sentiment is not manifested towards the voluntary hospitals, although they limit their assistance mainly to the poorer classes; and the view that this attitude should be encouraged as a sign of healthy independence is only put forward by those ignorant of the facts, and still possessed by the 'sturdy beggar' theory. When the Insurance Act was under consideration, an opportunity existed of sweeping away this stigma by incorporating the Poor Law medical system into a general public medical service, but unfortunately the opposite step was foolishly taken, and Poor Law authorities were rigidly excluded from those with whom Insurance Committees

might make arrangements for sanatorium benefit. Then, after emphasising the stigma of pauperism, the Insurance Act provides no alternative but the Poor Law infirmaries for many thousands of tuberculous insured persons.

But while the Poor Law medical service is restricted to indigent persons, the local administration of the vaccination laws by the Poor Law authorities for all classes of the community affords an illustration of a duty which has no relation whatever to pauperism. When, in 1840, vaccination was first provided at the public cost, the old Poor Law Board (with no medical officer in its service) was made the central authority, and local administration was entrusted to Boards of Guardians and overseers, for at that time there was no Local Sanitary Authority in existence. But since that date there have been many changes. Vaccination was made compulsory in 1853 ; the Poor Law Board has been swept away, and Local Sanitary Authorities created ; but though in earlier years the service was bad and there were flagrant instances of disastrous maltreatment, the Boards of Guardians have ever since continued to provide or supervise vaccination among all classes of the community.

The Metropolitan Asylums Board is an offshoot from the Poor Law, which now occupies a distinctly anomalous position. It was created in 1867 to provide for the reception and relief of the sick, insane, infirm, and other classes of the poor in London. By an Act of 1883, the civil disabilities which had till then attached to admission to the Board's hospitals were removed ; and by later Acts the Board was authorised to admit non-pauper cases of fever. Now the fever hospitals are used for the reception of patients of all social classes, and no trace of the stigma of pauperism attaches to admission thereto, although the Board is still legally a Poor Law authority. We may note here the extraordinary position to which this gave rise under the Insurance Act. We have seen that this Act requires arrangements for sanatorium benefit to be made with bodies *other than Poor Law authorities.* When, after the passing of the Act, arrangements for London were considered, it was at once realised that the Metropolitan Asylums Board, with its well-equipped hospitals

and sanatoria and buildings capable of being converted into sanatoria, was eminently the appropriate body with which to make arrangements. Indeed without its help there was no hope of making reasonable provision in London for a long time. Then arose the question: was the Board a 'Poor Law Authority'? No guidance was to be found in the Act or in the Parliamentary debates, and in fact it seems clear that Parliament had forgotten either the existence of the Board or its anomalous character. The managers of the Board themselves say in their report for 1912: "There is no doubt that the special position in London of the Metropolitan Asylums Board as in fact a Public Health and infectious hospital authority, was lost sight of." After prolonged discussion and taking of legal opinion, it was finally decided that the London Insurance Committee was prohibited from making arrangements with the Board. It was however held that the Insurance Committee might make arrangements with the London County Council, while the Council in its turn could make arrangements with the Metropolitan Asylums Board, and this was done, thus arriving at the end desired by a circuitous route. Then a year later, in the amending Act of 1913 the London Insurance Committee was authorised to enter directly into arrangements with the Board; from which it may be inferred that Parliament, if it had realised the position, would not have excluded the Board in the original Act. We may admire the ingenuity with which the administrative authorities circumvented the expressed intention of the Act, but we could not have a better lesson in the need for expert knowledge in Parliament when Public Health measures are under consideration, than the fact that this body, in a debate on the provision of sanatoria for the tuberculous, forgot either the existence or the anomalous character of the largest local authority in the country specifically charged with the duty of providing hospitals for infectious diseases, and actually maintaining sanatoria for tuberculosis at the time.

The Coroner affords another example of an interesting change of function. Though not usually recognised as a Public Health official, he does in fact conduct many

inquiries into deaths which closely touch Public Health matters. These duties are indeed more important than those connected with the detection of crime, which are for all practical purposes discharged by the police and magistrates; the police collecting the information upon which the Coroner acts, while, if the inquest verdict and magistrates' decision are not the same, the criminal courts are almost invariably guided by the latter. The Coroner, however, who dates from the twelfth century, was originally a revenue officer of the Crown, and was charged with the duty of confiscating the goods of criminals, taking possession of wrecks and seizing treasure-trove, a duty which still remains. He inquired into deaths for the purpose of ascertaining whether the deceased was an outlaw or felon or suicide, in which case his property escheated to the Crown.[1] Escheat however has been abolished, and the tax-collecting functions of the Coroner have long disappeared, but the ancient machinery with its obligation upon the Coroner to hold land in his district lest he might abscond with the proceeds of his inquiries, its jury of 'good and lawful' men, and its 'view,' the object of which was to make sure that there actually was a body present, still remain to serve a radically different purpose.

It is obvious that if we were now for the first time providing for the investigation of deaths from unnatural causes we should never dream of setting up the present machinery. The Coroner is not necessarily a medical man, and he need not and often does not call medical evidence; his procedure is not suitable for a scientific inquiry; and the final responsibility rests with a jury usually composed of artisans. 'Riders' are merely expressions of opinion which involve no legal consequences, and if abuses are detected, the Coroner has no machinery for bringing pressure to bear upon those responsible. Under these circumstances it is not surprising that verdicts are often palpably absurd, and serious errors are made in medical and scientific matters, perhaps the greatest of

[1] Pepys gives a very interesting picture of an inquest in the seventeenth century, and of the devices which were adopted by relatives to defeat this harsh law, in his account of the inquest.

which is the cruel injustice inflicted annually upon some hundreds of mothers who are informed, after a superficial investigation, that they have caused the death of their infants by 'overlaying' them in bed. If these deaths were the subject of efficient inquiry, there is strong reason to believe that the great bulk of them would be found to have been due to natural causes.[1]

It is of interest to recall that at one time we had a central Public Health Authority which distinctly approached a Ministry of Health, and would probably have developed into such a Ministry had it been given fair opportunity. This was the General Board of Health created in 1848 in consequence of the frequency of epidemics and the insanitary state of the country generally, which had been revealed in the reports of the Poor Law Commissioners. The new Board numbered among its members eminent men, such as Chadwick, Shaftesbury, and Southwood Smith, and did much useful work, particularly in the direction of removing refuse and improving drainage. But it worked under great difficulties: its existence was precarious, as it had only been appointed for a limited period; its executive powers were restricted; and it was not even authorised to appoint a medical officer until two years after its formation. The labours of the Board to improve sanitation aroused bitter hostility among vested interests, and the Board was also virulently attacked by those who, without knowledge of sanitary science, assumed the rôle of authorities and upheld the orthodoxy of the period.[2] In 1858 the Board was swept

[1] Justification for this statement will be found in *An Inquiry into the Statistics of Deaths from Violence*, by the author, 1915. Briefly, the reasons for the view expressed are: that there is no constant relation between overcrowding and deaths from overlying; that the rural death-rate is far smaller than the urban death-rate, the decrease being much greater in proportion than the decrease in overcrowding; that there is a marked seasonal variation in these deaths, the number declining in summer and rising in winter; that this variation agrees precisely with that of deaths from broncho-pneumonia, infantile convulsions, and atrophy, conditions presenting post-mortem appearances very similar or actually undistinguishable from those of overlying; and that when the post-mortems are performed by expert pathologists, overlying is very rarely found to be the cause of death.

[2] Herbert Spencer, for example, said: "These impatiently agitated schemes for improving our sanitary condition by Act of Parliament are needless, inasmuch as there are already efficient influences at work gradually accomplishing every desideratum"; and of the Board of Health he wrote: "It had more than a year's notice that the cholera was on its way here. . . . Well, what was the first step which

away and its medical duties were divided between the Privy Council and the Home Office. Sir John Simon has described the abolition of the Board as a 'catastrophe.' He says: "An earnest, powerful endeavour had mis-"carried. . . . In our sanitary case, too, the immediate "failure was only part of what had to be regretted. For "the invectives which had been meant to destroy the Board "had been too angry in their aim not to do much collateral "damage; and they continued to operate for several years "on a considerable scale, in maintaining suspicion and "prejudice against sanitary proposals and those who made "them." [1]

The Local Government Board was created in 1871 as a result of the report of the Royal Sanitary Commission of 1868, which demonstrated the confusion into which the administration of Public Health affairs had fallen. To the new authority were transferred the duties and staffs of the Poor Law Board and the General Register Office, and most of the medical duties of the Privy Council, though some of the latter remain to be discharged by that body, resembling the 'vestigial structures' of biologists. The union of authorities under the Local Government Board was however more in name than in fact, for the Registrar-General and the Poor Law and Public Health branches have always remained independent; and ever since the Local Government Board was created, we have been re-establishing the old confusion by assigning medical duties to other offices, or creating new authorities for

might have been looked for from it? Shall we not say the suppression of intra-mural interments? Burying the dead in the midst of the living was manifestly hurtful; the evils attendant on the practice were universally recognised; and to put it down required little more than a simple exercise of authority. If the Board of Health believed itself possessed of authority sufficient for this, why did it not use that authority when the advent of the epidemic was rumoured? If it thought its authority not great enough (which can hardly be, remembering what it ultimately did) then why did it not obtain more? Instead of taking either of these steps, however, it occupied itself in considering future modes of water-supply and devising systems of drainage. . . . As was said by a speaker at one of the medical meetings held during the height of the cholera, 'the Commissioners of Public Health had adopted the very means likely to produce that complaint. Instead of taking their measures years ago, they had stirred up all sorts of abominations now. They had removed dunghills and cesspools and added fuel tenfold to the fire that existed.' "—*Social Statics.*

Later knowledge has of course shown that the Board was entirely right in the measures it adopted, but it was clearly in advance of its time.

[1] *English Sanitary Institutions*, 1890.

special purposes. It may be of interest to examine some examples of the complexity of administration to which the constant multiplying of authorities has now led.

The Administration of Sanatorium Benefit

The central administration of this benefit is divided among three Government Offices: the Insurance Commissioners, who exercise control over the arrangements made by Insurance Committees; the Local Government Board, which is charged with the duty of inspecting and approving sanatoria and dispensaries, and of approving the appointments of tuberculosis officers; and the Treasury, which assents, if it thinks fit, to expenditure in excess of that provided by the Act, and must also approve proposals to treat diseases other than tuberculosis under sanatorium benefit. This division of authority greatly complicates administration, but the public do not become familiar with the conferences, committees, reports, etc., rendered necessary, since they affect mainly the internal working of the offices. Occasionally however it is possible to detect in the official reports issued by the Departments discreetly-worded evidence of acute difference of opinion which must have been productive of difficulty. The report of the Local Government Board for 1913–14, for instance, points out that while it is the duty of an Insurance Committee to decide whether an insured person should be recommended for sanatorium benefit, the Insurance Act does not require the Committee to determine the *form* of treatment he is to receive; and it shows further that many difficulties would have been avoided if it had been left to the tuberculosis officer to decide whether the applicant should receive sanatorium, hospital, or dispensary treatment, since he is the expert medical officer, and could determine the appropriate form of treatment on medical grounds. The Insurance Commissioners, on the other hand, hold that Insurance Committees must determine the form of treatment, and could not properly delegate this discretion to the tuberculosis officer, their reason apparently being fear lest the tuberculosis officer

should recommend too many persons for sanatorium treatment. The view of the Commissioners prevailed, but it is quite clear that the interests of the community were sacrificed thereby.

Locally, similar complexity exists. The Insurance Committee recommends insured persons for benefit and pays a contribution in respect of their treatment in sanatoria ; but the Local Authority provides the sanatoria and dispensaries, and appoints the tuberculosis officers ; while in London the position is further complicated by the powers and duties of the London County Council and the Metropolitan Asylums Board. Local arrangements have to be approved both by the Insurance Commissioners and the Local Government Board, and in many instances years of negotiation have preceded the final approval and adoption of a local scheme, while the money provided by Parliament for the relief of sufferers remains unspent. The amount allocated to England for grants in aid of sanatoria under the Finance Act of 1911 was £1,116,156, but up to June 1914 only £232,054 out of that sum had been promised to Local Authorities, and only £62,026 had actually been paid.[1] If the hardships fell upon those responsible for the confusion and delay, it would be deserved Nemesis, but unfortunately it is borne by many poor and inarticulate persons in desperate need of assistance. The number of beds is slowly increasing, but even with the aid of the voluntary hospitals and Poor Law infirmaries, and shortening of periods of residence in sanatoria, the accommodation is insufficient, and many sick persons are waiting for admission to the promised homes.

We may note another direction in connection with sanatorium treatment in which Parliament showed itself hopelessly lacking in appreciation of administrative difficulties. The Act provides that diseases other than tuberculosis can, on the recommendation of the Local Government Board, with the approval of the Treasury, be specially treated under sanatorium benefit " in sanatoria or other institutions or otherwise." To the inexperienced it may seem a simple matter to add other diseases when

[1] *Forty-third Annual Report of the Local Government Board.*

once a scheme for tuberculosis is in satisfactory working order, but those who have knowledge of administration will appreciate the immense difficulties in the way. New contracts and new arrangements would be required with Insurance Committees, Local Authorities, Approved Societies, doctors and chemists. Special statistics would be demanded in order that new estimates of cost might be obtained. Volumes of circulars, orders and instructions would be issued, and every step would necessitate consideration by committees and conferences, the reconciling of different authorities, and the satisfying of vested interests. No doubt the Departments concerned would cheerfully undertake the task, but the public should realise that it is proceedings of this kind which demand the services of so many thousand clerks and officials, and so enormously increase the cost of administration. According to the statement of Mr. Roberts, the present Chairman of the Joint Committee, it costs £600 merely to call the Advisory Committee together for one meeting. It is significant to note that the Local Government Board in the new arrangements for the treatment of venereal disease has not availed itself of the machinery theoretically available, by adding syphilis to the diseases treated under sanatorium benefit (which can be extended to non-insured persons), but has gone direct to the Local Authorities.

Administration in Connection with Maternal and Infant Welfare

Let us consider as another illustration of complexity in administration, the authorities concerned with the welfare of the mother and infant. The pregnant woman, if an industrial worker, is subject to laws restricting employment which are administered by the Home Office. At her confinement, if insured, she receives maternity benefit through her Approved Society ; if she is a pauper she may receive attendance through the Board of Guardians, while the midwife who attends her is subject to regulations made by the Central Midwives Board. The birth of the infant must be notified to the Medical Officer of Health,

but it must be registered at the office of the local Registrar, and the Board of Guardians again steps in to see that the child is vaccinated. If the child is put out to nurse, the person who undertakes its care is subject to supervision by the Local Authority. If the mother wishes for advice or help in the care of her baby she may go to a ' school for mothers ' which is under the Education Authorities, or to an ' infant welfare centre ' under the control of the Local Authority and assisted by grants from the Local Government Board, and either of these institutions may send a health visitor to advise her as soon as the infant is born.[1]

It is of some interest to compile a list of inspectors and officials from whom a working-class mother with a family of children may now receive visits. The list includes the Medical Officer of Health, the Sanitary Inspector, the Housing Inspector, the Health Visitor, the School Attendance Officer, the School Nurse, the District Nurse, a Member of the School Care Committee, the Sick Visitor or agent of her Approved Society, the Insurance Inspector, and in cases of poverty the Relieving Officer, and perhaps a representative from the Charity Organisation Society. It is well known that this continual series of inspections among the working classes has given rise to a widespread feeling of irritation, and a sense of infringement of privacy. The most recent movement is one for notification of pregnancy, and already certain Local Authorities (*e.g.* at Nottingham and Huddersfield) have instituted a system of such notifications, though it is not clear under what powers they have acted. If the visits of these inspectors and officials were productive of proportionate benefit a great deal could be said in their defence, but it is doubtful whether the whole system is having any appreciable effect in improving the

[1] In the matter of infant welfare the Board of Education and the Local Government Board are doing essentially the same work, and in the sections of their Annual Reports dealing with infant welfare they cover much the same ground. It is well known that this needless overlapping caused a disagreement between the two offices which led to a long delay before something approaching a working scheme was devised. The chief difference between the two sets of institutions is that while those assisted by the Local Government Board may provide treatment, the Board of Education centres are ' primarily educational,' the provision of medical and surgical advice and treatment being only ' incidental.' But, as Mrs. Acland has said: " When Mrs. Smith's baby begins to put on weight, who shall say whether we rejoice *primarily* because that means an improvement in Mrs. Smith's education or in the baby's health ? "

health of the working classes or reducing the death-rate. With the exception perhaps of the sanitary inspector, they do little or nothing to improve the environment; they do not provide healthy conditions of life or efficient medical attendance, or lying-in homes for mothers. As Mr. G. K. Chesterton has said, "they only move persons from Schedule A to Schedule B," while they lead the poor to feel that their liberty is infringed in a way the rich would not tolerate.

Many other instances could be given of the wearisome delays and confusion which this system of administration involves. There is, for example, the dust-siding at East Dulwich station, immediately adjacent to the Southwark Infirmary, instalments of the story of which have been appearing in the public Press since 1913. The Guardians alleged that dust was blown into the children's wards and set up enteritis, and the dispute has involved inspections and reports by four medical experts,—the Medical Officer of Health, the Medical Superintendent of the Infirmary, the Medical Inspector of the Local Government Board, and the Medical Officer of a Children's Hospital, while negotiations between the Guardians, the Borough Council, the Local Government Board, and the London County Council had extended over two years without a settlement having been reached at the time the last report was published.

Some of the disputes between overlapping authorities terminate in an agreement after more or less protracted negotiations; others end by the aggrieved authority becoming weary of the proceedings and letting the matter drop; but the most absurd termination, from the public point of view, is in litigation between the authorities. We have had examples of Insurance Committees taking legal action against Insurance Commissioners; of the London County Council proceeding against Borough Councils; and of Boards of Guardians threatening the Metropolitan Asylums Board. All these bodies are servants of the public, they are supposed to be acting in the interests of the public, and the public pays for their litigation whichever side wins. In the present chaos, litigation is no doubt sometimes unavoidable, but the situation is as

absurd as if a householder were compelled to pay for litigation between his cook and his housemaid as to who should clean his knives or boots.

Administrative Authorities and Statistics

The lack of coördination among Government Departments is almost incredible to those who have not had actual experience of their internal working. There are instances of one Department laboriously setting to work to collect information on a subject, full details of which are in possession of another Department, and have perhaps actually been published; of two Departments independently making precisely the same investigation; of one Department not knowing what another has done or is doing; and of one Department not being able to take an obviously desirable step because it would infringe the prerogative of another. These matters do not usually become public, but we have a striking illustration of the want of coördination in the annual returns and statistics published by the different offices.

Statistics relating to Public Health are of great importance. They afford the only scientific means of determining the extent and distribution of disease either in classes of persons or geographical areas; they furnish a test of the effects of legislation and administrative orders; and they are, or should be, the basis of new Public Health legislation. Without statistical knowledge of the prevalence and causation of industrial diseases and accidents in factories, mines, and railways; of sickness in special areas; and of invalidity—efforts to improve conditions are based upon little more than guesswork.

The value of different sets of statistics is very greatly increased when they are in a form which renders them comparable one with another; and for this purpose, speaking generally, it is necessary that they should apply to the same geographical units or units of population and the same period of time, divide the classes of persons into the same age-periods, employ the same basis of classification of diseases and causes of death, and use scientific terms

with a constant meaning throughout. But when we turn to the Public Health statistics issued by the Government Departments we find the most extraordinary want of coördination among them, which often effectually prevents them from being used together, and seriously reduces their value both individually and collectively. There are at least ten different reports which bear upon Public Health issued annually by the Home Office, the Registrar-General, the Local Government Board, the Board of Education, and the Board of Trade, but scarcely any two of them (even when issued by the same office) agree in their geographical units, or periods of the return, or age-periods, or system of classification and nomenclature. There are separate Registrar-Generals for Scotland and Ireland, and each adopts a form of classification differing in important respects from the English system. Some statistics are for the United Kingdom only, returns for the separate countries not being distinguished; some are for England, Scotland and Wales as a whole; some for England and Wales, and some for England excluding Wales. Uniformity is not even observed in the boundaries of the countries, Monmouthshire, for example, being placed in Wales by the Registrar-General and in England by the Home Office. The Local Government Board and the Board of Education begin their year in April, most of the other offices begin in January, but the report on the Working of the Boiler Explosions Act begins in July. Some reports tabulate deaths *registered* during the year, others the deaths which actually occurred during the year.[1] Systems of nomenclature vary, and even such words as 'violence,' 'neglect,' 'suffocation,' and 'abortion' have different interpretations placed upon them by different Departments.

The writer has elsewhere brought forward numerous instances of the confusion and difficulties which result

[1] A good instance of the confusion which results from this particular want of uniformity is afforded by the returns relating to deaths in coal mines for the year 1911. According to the Home Office report there were in that year 1050 deaths in English and Welsh coalfields; according to the Registrar-General the number was 1364. The difference is almost entirely accounted for by 342 deaths which occurred in the Pretoria mine disaster on December 21, 1910, but were not registered till January, thus appearing in the Home Office statistics for 1910 and in the Registrar-General's volume for 1911.

from this want of uniformity, and the way in which they impede investigation.[1] Deaths from infectious diseases are tabulated in one volume, the Registrar-General's report, but cases of sickness from these diseases are contained in another, issued by the Local Government Board; and if we attempt to use these volumes together, we find that the Registrar-General classifies his deaths according to aggregates of Administrative Counties, County Boroughs, Rural Districts, etc., in England and Wales, while the Local Government Board classifies the cases in similar aggregates for England and for Wales separately. Hence the two returns are not comparable except as regards England and Wales as a whole, and London, though these two offices are supposed to be 'united,' and are under the same Minister of the Crown. Remarkable discrepancies are revealed by comparison of reports dealing with the same deaths, the Registrar-General, for example, recording 36 deaths from 'alcoholism' in Liverpool in 1912, while the Home Office tabulates 113 inquest verdicts of 'death from excessive drinking.' Three Departments, the Local Government Board, the Registrar-General, and the Home Office, tabulate deaths from starvation, cold, exposure, etc., but their totals and geographical distribution of the deaths differ widely from each other, and a very simple analysis of the Local Government Board report will show that it is seriously incomplete.

Since we have no central statistical office, each Department decides for itself what matters shall be the subject of statistical analysis, and how far that analysis shall be carried, with the result that remarkable disproportion exists between the amount of attention and space given to different matters, some being analysed minutely, and others of equally great or greater importance being neglected. We can learn from the Board of Trade the precise number of signal-box lads who suffered from sprain, of railway porters who received cuts or lacerations, and of engine-drivers who were burnt or scalded. On the other hand, the Poor Law branch of the Local Government Board issues no medical report; and, except for a few

[1] *Op. cit.*

details connected with maternity, we have no statistical information whatever relating to the great number of patients in Poor Law infirmaries; though the Board requires medical officers of these institutions to keep proper records. As far back as 1904 the Inter-Departmental Committee on Physical Deterioration made the following recommendation :—

> It appears to the Committee in the highest degree desirable that a Register of Sickness not confined to infectious diseases should be established and maintained. For this purpose the official returns of Poor Law Medical Officers could, with very little trouble and expense, be modified so as to secure a record of all diseases treated by them. And, further, it ought not to be difficult to procure the co-operation of hospitals and other charitable institutions throughout the country, so as to utilise for the same purpose the records of sickness kept by such institutions.

The Local Government Board however took no action in regard to Poor Law medical officers, and it was nobody's business to secure co-operation of the hospitals. Had the recommendation been acted upon, it seems probable that useful information would have been available for the actuaries when estimating for the Insurance Act. The statistics would not have given a sickness rate in a working population, but they would at least have shown that sickness is greater among women than among men, that married women suffer more illness than single women, and that pregnancy may be a cause of sickness.

The Annual Reports of the Registrar-General for England and Wales are models of clearness and scientific accuracy, and are probably the best of the kind issued by any Government in the world. A central statistical Department for Public Health purposes is urgently needed, and we could not do better than make the Registrar-General's Office the nucleus of this Department, not only for England and Wales, but for the United Kingdom. The report of the Registrar-General for Ireland is also good, but in some respects the statistics need standardising and coördinating in order to render them comparable with those of England and Wales. Of the report of the Registrar-General for Scotland, Professor Karl Pearson

said some years ago: "The Scottish statistics are very "bad. Scotland has done with her relatively small means "such splendid scientific work, that I hope she will pardon "me when I say that the data provided by her Registrar-"General rank almost at the bottom of European "statistics."[1] This criticism is still deserved to-day, for the statistical tables seem almost designed to give the minimum of information with the maximum of inconvenience.

The Discouragement of the Present System

The wasteful, cumbersome, and dilatory procedure of Public Health administration in this country is demoralising to the official and discouraging to the social reformer. The official who comes newly into a scheme which has gradually grown up through long ages, finds himself bound by Acts of Parliament, legal decisions, regulations made by his predecessors, customs and rights. By himself he can do little to bring order into the chaos, and his efforts at reform will be met by snubs from those who have become bond-servants of tradition. Soon he also learns that ease and advancement are to be attained by adherence to established routine. Social reformers find it difficult to fix responsibility: their representations and proposals go from Committee to Council, from Council to Board, and back to them without effect; they see their efforts defeated again and again, and the abuses they would check, flourishing year after year. The futility of agitation is realised, zeal in the public service is destroyed, and ultimately effort is abandoned. All the time knowledge is being wasted, and many of the gifts medicine could bring to the nation are lost. Sir Clifford Allbutt has well described the effects of this confusion in the following words:—

"Medicine, as a function of the State, is still working as it were with her left hand. Her scattered official members have no unity; working everywhere piecemeal she has no coördination, no integrated self-consciousness. With no fixed apparatus for concerted action, energy

[1] *Tuberculosis Heredity and Environment*, 1912.

is wasted in overlap, in jostling, in divided purposes, and in anomalies. Although her influence is penetrating into almost every function of society, and directly and indirectly she is spending a great revenue, yet she passes through the councils of the nation veiled and irresponsible. The new ideas which are stirring society are largely medical, yet society does not know where, in the back staircases or garrets of the Local Government Board, of the Home Office, of the Colonial Office, of the Education Office, of the Board of Trade, of the Post Office, of the Registrar-General's Department, of the Lunacy Commission, and so forth, each bee buzzing in its own little cage, medicine is to be found ; nor how this new solvent and all-pervading influence is to be brought to the book of revenue, or to the bar of public opinion and responsibility." [1]

[1] *Hospitals, Medical Science and Public Health,* 1908.

CHAPTER X

THE NEED FOR A MINISTRY OF PUBLIC HEALTH

The lack of scientific criticism of Public Health measures—The need for a Ministry of Public Health—Royal Commissions and Public Health research—Administrative Offices and Public Health research—The Office of the Registrar-General as the Ministry of Public Health—The proposal to form a Ministry by uniting the present administrative Departments—The personnel of a Ministry of Health.

The Lack of Scientific Criticism of Public Health Measures

We have now surveyed the causes responsible for the failure to make the best use of medical and scientific knowledge in the interests of the State, and consequently for a low standard of Public Health, and we find that they fall broadly into three groups, viz. (1) vested interests—mainly those attaching to land ; (2) complexity of administration ; and (3) mistakes and ignorance of legislators and administrators. The first we have already examined ; ways and means of overcoming the second and third have now to be considered.

Throughout almost the whole range of Public Health activity we find instances of waste and inefficiency which have resulted from sheer lack of knowledge among those responsible either for enactment or administration of Public Health measures. Preventive medicine is a profound science, but no expert knowledge seems to be thought necessary in those who endeavour to apply its teachings to society. When proposals for any new step are made, the views of the amateur appear to be regarded as of equal weight with those of the lifelong student of Public Health ; vague generalities masquerade as scientific deductions ;

and conclusions put forward by scientific men with reservation, and intended only to hold good under certain conditions, become established truths of universal application. We have examined many instances of this process. Medicine taught that sanatorium treatment is sometimes beneficial in selected cases of tuberculosis; but politicians were responsible for magnifying this into a sweeping generalisation, disregarding the truth that tuberculosis is the outcome of environment, ignoring the lessons of Germany, and thrusting upon the country a costly scheme of treatment now shown to be of little avail to cure or prevent tuberculosis among the working classes. Science did not establish a system of medical treatment of children which begins at an age when already great harm has been done, and endeavours to detect 'incipient' maladies by an examination every two or three years; and science does not countenance the view that small weekly payments during sickness will compensate for a vicious environment; nor that men and women suffer equally from sickness; nor that maternal ignorance is the great cause of infant mortality; nor that half the total still-births are due to syphilis; nor that tuberculosis is a seriously infectious disease. Scientific investigators eagerly demand more knowledge of the distribution and causation of disease; but they were not responsible for the folly of the medical record cards, and the recording of everything from a cut finger to cancer as a basis for scientific monographs. It was hasty assumption which gave us a panel service without the need for hospital accommodation ever having been investigated; attached so overwhelming a value to treatment by drugs; and produced a provision intended to improve conditions, based upon sickness rates which cannot be obtained. It is ignorance which claims all decline in the death-rate as due to sanitary effort; and ignorance which every year leads to more than a thousand mothers being wrongfully told that they have overlain and killed their babies. Unsound views initiated in high places spread to the masses, among whom it may be years before they can be eradicated; while in the accumulation of errors and unworkable measures the fundamental causes of sickness

become obscured, and costly palliatives one after another are adopted. Wherever effort to improve Public Health has failed, it has not been the fault of medical science, but of legislators and administrators who have misunderstood that science, or have failed to appreciate the difficulties and conditions under which they proposed to apply its teachings.

Under the present system a Public Health Bill may pass through the legislature without receiving any expert criticism during its whole course. It may be drafted in an administrative Department by non-medical civil servants, or, if a medical officer to the Department is consulted, his views may be overruled by lay authority without the public becoming aware of the fact. It may be introduced by a Minister who has no special knowledge of the subject, and who has not obtained expert opinion or consulted learned Societies dealing with its problems. The Bill passes through a House of Commons in which there is only a handful of medical men, most of whom have abandoned medicine for other professions; and finally when it becomes an Act, its administration is placed in the hands of a Department in which medicine is kept in a strictly subordinate position. We may contrast the representation of the medical profession in Parliament with that of the legal profession, which contributes one quarter of the members of the House of Commons, as well as numerous members of the Government; and we may also compare it with the conditions in France, where in the legislative body at a recent date, 59 Deputies, 37 Senators, and 2 Ministers of State were all members of the medical profession.

The Need for a Ministry of Public Health

The first great step, then, in reorganisation of Public Health affairs is the creation of a central investigating authority, a Ministry of Public Health, which shall examine generally all conditions militating against health, and shall advise upon all proposals intended to cure or prevent disease. The Ministry would examine all Government

Bills relating to Public Health, study the conditions under which they are to operate, and estimate as far as possible their probable effects. It should have the right to institute inquiries on its own initiative into conditions affecting health in any class or locality ; it should receive all scientific and medical reports from other Government Offices, Local Authorities, Medical Officers of Health, Poor Law Medical Officers, School Doctors, Factory Inspectors, etc. ; and it should have power to prescribe the forms in which statistics are to be compiled, and returns made by every Public Health authority or officer, central or local, throughout the country, in order that it may become a central Public Health Statistical Office. The Department would be a great repository of knowledge, and could act in a consultative or advisory capacity to all authorities engaged in Public Health administration.

It is important to notice that the type of research which would be undertaken by the Ministry is not so much that which depends upon pure science, as that which relates to the sociological side of medicine, that is the applicability of scientific discoveries to Society. Purely scientific research into what has been termed the ' test-tube ' side of medicine is now fairly well provided for by the Research Committee, the grants disbursed by the Local Government Board, and assistance provided by the Cancer Research Fund, Universities, and learned Societies. These bodies however are not constituted adequately to undertake sociological medical research, since they have no power to prescribe returns and statistics, and to coördinate different authorities, and they do not possess the staffs necessary to conduct the great and laborious investigations required. Sociological research however equally demands profound knowledge of hygiene and independence of judgment in the investigator. To secure these, the Ministry must be staffed by persons of the highest scientific eminence, and it must be practically free from direct responsibility for administration.

Before discussing further proposals for reorganising the Public Health services, it may be useful to examine two directions in which partial compensation exists for the

absence of an investigating authority, viz. Royal Commissions on Public Health questions, and investigations by Government Departments. By noting the disadvantages which attach to those methods we shall learn further lessons in the need for an independent research authority.

Royal Commissions and Public Health Research

The practice of submitting some Public Health questions to Royal Commissions, Departmental Committees, or similar bodies, is itself an indication of the deficiency in expert knowledge in Parliament; but it does not meet the want, for not all questions may be so submitted, and Bills of great importance may be introduced without any previous investigation having been made. Royal Commissions vary widely both as regards the functions which are assigned to them, and as regards the thoroughness of their investigations and the value of their reports. Some —mainly those appointed primarily to conduct a piece of scientific research, and staffed by scientific men—have done work of the highest importance. Such were the Royal Commission on Human and Bovine Tuberculosis, and the Departmental Committee on Lighting in Factories and Workshops. The report of the latter, though not of general interest, embodies research of the most highly scientific, painstaking, and detailed character, and if all our Public Health proposals had been submitted to so excellent and thorough an investigation we should have been saved many a grievous mistake. On the other hand, some Royal Commissions are appointed not so much to conduct investigations as to give effect to certain widely-held, preconceived views; and their members then usually consist of those who hold those views most strongly, those who might be expected to oppose them, and representatives of persons or interests likely to be affected by the proposals, with the result that the main function of the Commissioners is to arrive at a compromise between conflicting opinions as to what can or ought to be done. Such a Commission may be both useful and necessary, but it is not constituted

to conduct a scientific inquiry, and it cannot be regarded as replacing that inquiry. An instance of this kind was the Royal Commission on Venereal Diseases, which consisted of eminent doctors some of whom held strong views on the subject before their appointment, representatives of religious organisations, Government officials, and persons specially interested in women's welfare. The proposals of the Commission were therefore highly useful as representing the views of a very diverse body of persons as to the measures which can be applied to the community. But their report cannot be regarded as a scientific document. It makes scarcely any increase in our scientific knowledge of these diseases, it contains conclusions founded on the scantiest of evidence, and statements which appear to the writer contrary to the evidence given by witnesses.

Another objection to Royal Commissions is the slowness with which most of them work. The Royal Commission on Sewage Disposal was appointed in 1898, but did not present its final report until 1915. The Departmental Committee on the Use of Lead in the Painting of Buildings, appointed in 1911, took three years over its investigations and preparing its report, but only met on forty-nine days during that period. These delays are mainly due to the fact that Royal Commissions are generally staffed by men busily engaged in other occupations who can devote only a limited amount of time to the purposes of the inquiry.

When a Commission has issued its report it is disbanded, and no authority exists which can continue its labours, keep its statistics up to date, and maintain interest in its proposals. Thus if action is not promptly taken on the report, often the whole matter is dropped, and the labour of the Commission is largely wasted. The history of Public Health effort is beset with instances where this has happened. It is notorious, for example, that the present system of registering deaths is highly unsatisfactory and even dangerous; and amendment of the law was urged by the Select Committee on Registration and Certification of Death as long ago as 1893, and at intervals subsequently

by various public bodies including the London County Council and the Medico-Legal Society, but no action has ever been taken. State action in regard to venereal disease affords another instance. In 1904 the Inter-Departmental Committee on Physical Deterioration strongly advised an investigation into the prevalence of venereal disease, but it was ten years before the Local Government Board, stimulated by the International Medical Congress, made any inquiry, or took steps leading to the appointment of the recent Royal Commission. The central investigating body here suggested would in effect be a standing Royal Commission on all Public Health questions, and would not allow proposals to be dropped until they had been considered by Parliament.

Administrative Offices and Public Health Research

The administrative Departments have also at times conducted investigations of great value — those, for example, of Dr. Newsholme and his staff on infant mortality have become classic. But the great disadvantage of a Department undertaking research into the matters it administers, is the difficulty of getting unbiassed investigation; since the Department is nearly always committed to some definite line of policy, and is responsible for carrying that policy into effect. The Insurance Commissioners, for example, are obviously not the persons to approach for an impartial investigation into the value of the Insurance Act in improving Public Health; the Board of Education cannot avoid exaggerating the importance of instruction in hygiene, or attributing larger effects to the school medical service than it has produced or is likely to produce; and the Local Government Board is not the authority to give us, for example, an unbiassed monograph on the necessity of continuing vaccination. It is impossible to read the Blue-books and reports issued by these authorities without realising that each exaggerates its own sphere of usefulness in the Public Health scheme. Even in reports in which clearly every effort has been

made to be scientific we find official bias tends to appear.[1] Freedom from administration is essential for independence of judgment.

Another result of having several Government Departments each investigating conditions in an isolated section of the community, is to give us an incomplete picture of the state of Public Health as a whole. Much attention for example has been focussed upon infant mortality, but few observers have directed notice towards the great and preventable loss of life which is occurring in the second year of life. Some diseases and conditions are kept continually before the public eye, while others equally or even more controllable are relatively neglected; every one is familiar with the evil of tuberculosis, but few have realised the extent to which we are ravaged by pneumonia and bronchitis from infancy upwards. And equally we receive an incomplete and distorted picture of the causes of disease and of the steps necessary to prevent them. Certain causes of ill-health are continually emphasised while other matters of the greatest importance are never investigated at all. The Board of Education would have us believe that education is the great path to sound national health; the Local Government Board bids us place our faith in sewers; and the Insurance Commissioners will cure us with drugs and doctors; but none of these authorities, or any other Government Department, has ever made a comprehensive investigation into the difference between urban

[1] For example, the recent report of the Local Government Board on Maternal Mortality in connection with Child-bearing, attributes the high rate of maternal mortality in certain Welsh counties in part to deficiency in the quality of supply of midwifery assistance, and continues: "If the excessive mortality from child-bearing in Welsh and northern counties is ascribable to a material extent to deficiency of skilled assistance in child-birth, it might be anticipated that the low mortality in the last-mentioned counties [Isle of Wight, Buckinghamshire, West Sussex, Oxfordshire, Isle of Ely, Stoke of Peterborough, and Rutland] would be associated with an adequate medical and nursing service. The evidence on this point is, however, imperfect." But why is this evidence imperfect? These counties are more accessible and easier of investigation than those of Wales. Why are figures, which *prima facie* appear to negative the preceding deduction, dismissed in a single sentence, and the report published before the exact conditions in the counties to which they relate have been investigated? In another part of the report we find the unscientific statement: "No completely consistent relationship between excessive mortality from child-bearing and a high degree of employment in factories is visible in these tables, though it can scarcely be doubted that a close association exists between the two factors." It must not, however, be inferred from these extracts that the report is not a brilliant piece of research into an intricate subject.

and rural mortality and its causes, or has shown that at the bottom of nearly all our Public Health difficulties lies the land question. Quite properly they would consider that this subject is outside their respective spheres, and being so, it is outside the sphere of any office—except, to a limited extent, that of the Registrar-General—and thus this question, the most important of all which relate to Public Health, is never adequately studied.

The Office of the Registrar-General as the Ministry of Public Health

There is one Government Department which is admirably adapted to be transformed into a Ministry of Public Health of the type suggested, and that is the office of the Registrar-General. This office is already almost entirely in the nature of a research Department; it has no administrative functions except those necessary for its own special purposes; and it produces every year the most valuable and highly scientific report on Public Health which we possess. The Annual Reports of the Registrar-General are conspicuously free from bias; they serve as the basis of all accurate knowledge relating to mortality; they are continually used and quoted by the medical officers of other Government Departments who indeed would be almost powerless without them; and their cold hard facts give us a true picture of what is occurring, without which we should be still more led astray by the eulogistic utterances of other Departments which are their own judges of their work. The Registrar-General compiles the statistics of births and marriages; but the great bulk of his report is devoted to an analysis of the causes and distribution of deaths. What is here proposed is that the Registrar-General should do for sickness and disease among all classes, infants, children, mothers, insured and non-insured persons, paupers, factory operatives, etc., what he is doing for mortality; and that for this purpose the whole of the medical statistical work of the Local Government Board, the Board of Education, the Home Office, and the Insurance Commission should be handed

over to him with the staffs specially concerned with that work.

The Proposal to form a Ministry by Uniting the present Administrative Departments

It will be objected that the scheme outlined above still leaves a number of isolated medical Departments working independently, for it is to prevent this that the proposal to form a Ministry of Public Health by uniting the present offices finds so much favour. But attractive though this proposal may seem at first, careful consideration will show that there are strong reasons against it. In the first place, the medical administrative duties of some of these offices are so closely connected with their general spheres of work that to separate them would be highly inconvenient. It is obvious, for example, that the Board of Education must administer the school medical service, for it would be extremely confusing for another Department to frame regulations concerning grants, visits of school doctors, duties of teachers in connection with medical inspection, and other matters which demand familiarity with the distribution of the schools, the size of classes, times of holidays, etc. Similarly the Home Office, which is responsible for the general administration of the Factory Acts, must control the routine work of the medical inspectors who assist in carrying out those Acts. On the other hand, the purely scientific and research work of both the Board of Education and the Home Office could quite fitly be transferred to the Ministry of Public Health.

The fact is, that it is not so much uniting as coördinating which these bodies need, and it is mainly in the scientific and statistical work that coördination is required. Moreover, any union would probably be more in name than in fact. We could take out the medical staffs of the Local Government Board, the Board of Education, Home Office, Insurance Commission, etc., set them down in a building in Whitehall, and call them a Ministry of Health ; but the result would almost certainly be jealousy and confusion,

ending in the establishment of a number of separate branches, which, though under one roof, would remain as much uncoördinated and distinct as they are at present—repeating what happened when the Registrar-General, the Poor Law Board, and the Local Government Board were "united."

Finally the great disadvantage would remain that a Ministry of Health created by uniting the present medical Departments, would still be its own critic and judge. At present an administrative Department includes or omits just what it pleases in its annual report, prepares the answers to Parliamentary questions impugning its administration, and, when publicly attacked, takes refuge in the unwritten law—excellent for the Department, but prejudicial to the public—that a Government office shall never reply to or defend itself against attacks, except through the Minister responsible for the office to Parliament. In return the actions of the Minister must be supported. Thus a kind of confederacy grows up which necessarily brings the Department under political influences. The officials come to regard their first duty as owed to their political chief instead of to the public, and the Department must always be made to cut a good figure in Parliament. Eulogistic statements and statistics are drafted in the office for the Minister to present to Parliament, and if an Act does not appear to be working satisfactorily, the Department provides the Minister with ingenious answers to questions, statements of the extent of its operations, and statistics of the number of persons it claims to have benefited. The investigations and returns of a Ministry of Health would give us more reliable information, and would indicate what measures had been beneficial and what further efforts are required.

But while on the whole the principal Departments must be left to administer their special services, there is undoubtedly room for coördination and re-arrangement among them. Administration would be much simplified by decentralising many services, and in the next chapter proposals will be made for increasing the powers of local authorities, particularly in the direction of allowing them

to establish local medical services in accordance with the needs of the locality. If this principle were adopted, many of the duties at present discharged by central authorities would be transferred to local bodies. It will be proposed that medical and sanatorium benefit should be taken out of the Insurance Act, and merged into local medical services no longer applying exclusively to insured persons. The Insurance Commission would then remain simply a financial office responsible for the central administration of sickness and maternity benefit as forms of assistance, and would have no relation to Public Health. Similarly, the medical side of the Poor Law might be absorbed by the local medical service, and the medical functions of the Poor Law branch of the Local Government Board would then disappear. The overlapping of the Board of Education and the Local Government Board in the matter of maternal and infant welfare might come to an end, and as there is no reason why these duties should be performed by the Board of Education, they should be transferred to the Local Government Board. The duty of compiling the annual statistics relating to coroners' inquests should be transferred to the Ministry of Health from the Home Office; for the latter has left them practically unrevised, and in an almost useless state for nearly fifty years. The grant made to the Local Government Board for research should be transferred to the Ministry, and the Research Committee should form part of the new office. The Ministry of Health should take the place at present occupied by the Privy Council in relation to the Central Midwives Board and the General Medical Council, leaving these authorities otherwise unchanged, though it might take over from the General Medical Council the duty of issuing the British Pharmacopœia which is a purely scientific matter. The duty of the Pharmaceutical Society to advise on the scheduling of poisons might also be transferred to the Ministry.

The medical duties of the War Office and the Admiralty must remain entirely distinct; and the functions of the Colonial Office in the investigation of tropical diseases are also so sharply delimited that there would be no need to

interfere with them, though the Ministry of Health might be authorised to assist in the establishment of schools and laboratories for this purpose.

There are certain other matters which, though they involve administrative action, are almost entirely of a scientific character, and are therefore appropriate to be transferred to the Ministry. Such are the determination of what infectious and industrial diseases shall be notified under the Infectious Diseases Act and the Factory Acts; the prescribing of standards of purity of milk, butter, and other foods, and the issue of regulations for the purpose of detecting and preventing adulteration. If the recommendation of the Committee on Patent Medicines be adopted, the control of advertisements of these preparations should also be assigned to the Ministry.

The preceding paragraphs do not purport to contain more than the barest outline of a scheme for reorganising the Public Health Departments. The suggestions are intended to make clear the general principle proposed, viz. the establishment of a Ministry of Health, limited in its executive powers, but investigating and recording in every direction; and coördinated with it, administrative Departments directly responsible for administering Public Health measures which demand executive action. But while the principle of division is clear the details will require prolonged consideration and very careful adjustment. Probably the best plan would be to appoint the Ministry first on the lines suggested, and authorise it to inquire into the whole system of Public Health administration and recommend what further changes are desirable. Any other course would lead to serious delay in a matter which is of the greatest urgency. Suppose for example it is decided to form a Ministry on the lines usually proposed of uniting the present Departments. The Bill necessary would be gigantic in its scope; and would involve many difficult questions, and affect many interests. It could not be satisfactorily considered if introduced before the termination of the War, and it would probably be delayed until a new Parliament had been elected, and even then deferred until various after-war problems had been dealt with. If

the question were referred to a Royal Commission further delay would occur.

On the other hand it would be a comparatively simple matter to create the Ministry side by side with the present Departments. We should at once meet the greatest necessity in our present system, that of an investigating authority; and we could add other duties to the Ministry one by one, thus effecting the change with the minimum of inconvenience.

The Personnel of a Ministry of Health

In order that it may properly discharge the functions suggested, the permanent staff of the Ministry of Health must consist almost exclusively of medical and scientific men. It must include those who have devoted themselves to the purely scientific aspects of medicine and hygiene; those who are authorities in special branches, bacteriology, pharmacology, food analysis, hospital construction and equipment, sanitary engineering, water-supply, industrial diseases, statistics, etc.; and those who have had personal experience among the poor as Medical Officers of Health, Poor Law Medical Officers, school doctors, and practitioners, and who know the practical difficulties which have to be overcome in applying the results of scientific medicine to human beings under the worst possible environment.

This proposal involves a break with the traditional belief that lay civil servants can fitly undertake the administration of medical and Public Health affairs. The view that medical men cannot be trusted to exercise more than very limited authority, and that they are present in a Government office mainly in an advisory capacity though they need not be consulted nor their advice taken, strongly characterised the earlier administration of the Public Health services; and, though modified, exists to this day in the Civil Service to a degree only known to those who have had personal experience in a Government Office. Writing of the old Poor Law Board, which exercised

numerous medical functions from 1847 to 1871, Sir John Simon said :—

> Perfunctoriness had characterised its work in matters of medical responsibility. The root of the fault, giving rise to much which had gone wrong in the medical relations of the Office, was, that the Board had relied very unduly on the sufficiency of non-medical officers in those relations. The original theory seems to have been that on any extraordinary occasion extraordinary assistance could be obtained; but that for the ordinary medical business of the Board, the common sense of secretaries, assistant secretaries and secretarial inspectors did not require to be helped by doctors.

And writing in 1890 of the earlier years of the Local Government Board he said :—

> They did not entrust to the Medical Department any systematic share in the supervision. The essentially supervisional arrangements were to be non-medical; and except as to the superintendence of vaccination (which was let continue much as it had previously been) the Medical Department was only to have unsystematic functions. In cases where the President or a Secretary or Assistant-Secretary might think reference to the Department necessary the individual reference would be made; and where, on motion from the Medical Department or otherwise, he might think medical inspection necessary, he would specially order the inspection; but these unsystematised inspections could not extend to more than comparatively few localities in a year, for the medical staff was not allowed the enlargement which had been hoped for a provision for larger usefulness. In general, the business of the Public Health seems to have been understood as not requiring any other system of supervision than the non-medical officers could supply.

At the present day the Chief Medical Officers of some Departments have considerable liberty of action though they are always subordinate to lay authority. But this is not universal. Under other circumstances the Chief Medical Officer of a Government Office, though highly salaried and brilliantly qualified, may be kept in a strictly subordinate position devoid of influence or dignity. He may not write an official letter, he has no voice in the appointment of his junior staff, he may or may not be consulted by his administering authority, and, if consulted, his opinion on a purely technical point may be disregarded. Some of the most elementary mistakes in recent Public Health administration have resulted from such conditions.

The distrust of the medical administrator in the Civil Service appears to arise from fear that he may make a mistake in some legal point, or may fail to carry out his duties in a strictly official manner. Hence practically only lawyers and those who have had a Civil Service training may be permitted to handle the administrative machine. Even the Chairman of the purely scientific Medical Research Committee is a member of the legal profession. It is not realised that a mistake in medicine by a legal administrator may be infinitely more disastrous to the community than a mistake in law by a medical administrator. The present theory of official control leads to an aggrandisement of the means at the expense of the end. The fact that the ultimate aim of the whole machinery, authorities, committees, experts, Acts, and regulations, is the improvement of Public Health tends to be lost sight of; and the working of the machine in strict accordance with the letter of the law, whether beneficial or not, is regarded as the great object to be achieved.

But the training of neither the lawyer nor the civil servant fits them to deal with the problems of Public Health. Few of them have had personal experience of the lives and conditions of the poor when struggling against sickness; the things they deal with are not real to them, and in consequence they lack the sense of responsibility which knowledge of the way their actions may affect the lives of many thousands of humble folk would bring to them. This knowledge is only possessed by one who has been through the mill himself, who has heard the "knocker-up" at 4 A.M., while he sits waiting for the baby to be born in a northern slum tenement from which the father and children have been turned out on to the stairs, or into the overcrowded room of a kindly neighbour; or has spent hours prescribing for a crowd of ailing panel patients, knowing all the time how little real good he can do them; or has served as medical officer to a committee or authority which can determine his tenure of office, and includes among its members some most interested in maintaining the very abuses he seeks to abolish. If civil servants had had these experiences it is certain that they

would give far more consideration to the circulars and administrative orders which emanate from Government offices. We should not have red tape continually hindering the already tardy assistance given to the working classes; decisions arrived at on the most perfunctory investigation; the last items on a Committee's agenda hurried through; medical opinion continually overruled; and vitally important questions indefinitely postponed simply because they are difficult to deal with. It was once proposed that every Judge of a Criminal Court should spend a week of the year in prison; and on the same principle it is to be regretted that we cannot compel every lay Public Health official to spend a month as a panel doctor in a slum district.

Moreover, the average civil servant has not had the scientific training, which would enable him to distinguish between sound deductions and unverified generalities; and he has no means of acquainting himself with advances in medicine and hygiene. It is the absence of this training in the majority of civil servants which makes them so timorous of doing anything that involves innovation or liberty of action. For every step justification must be found in an Act of Parliament or regulation, and the attitude towards medical men is expressed in the words of a Secretary of a Government Office who said to the writer: "The medical men we want here are humdrum persons who won't be continually proposing new things. We don't want clever doctors in the Civil Service." Tradition and precedent are their guides, reinforced by the appreciable proportion of lawyers in the service; yet precedent, so dear to the lawyer, is the very last principle which should govern administration of the ever-changing and ever-widening sphere of Public Health.

The objection may be made to these proposals that they tend to place too much power in the hands of doctors. The fact must be recognised that, whether justified or not, there is among the laity considerable distrust of the medical profession; and the plea would certainly be made that, even if the staff are medical men, the supreme head of the Department must be a layman,—a principle which

has been almost invariably observed in the War Office and Admiralty.[1] These, however, are executive offices, possessing powers of compulsion over the acts and lives of citizens, and in a democratic country their ultimate control must remain in lay hands. But the Ministry of Health here proposed is of an entirely different character. It is to be an office for research and investigation, and is to have no authority, except such as comes from the weight of its opinion; and no power of issuing orders, except such as are required for purposes of research and the advancement of knowledge. It is therefore much more comparable with, let us say, the Geological Survey, and at the head of this no one would propose to place other than a geologist. But just as the authorities which use the results of the Geological Survey, its maps, its knowledge of mines, its information regarding water-supply, etc., are under lay control, so the administrative Departments which employed the knowledge collected by the Ministry of Health would remain as at present under lay authority. Whatever scheme for a Ministry of Public Health be adopted, it must be recognised that if it is to be administrative, it must ultimately be subject to lay authority. Nothing else is in accord with democratic principles. But in the opinion of the writer it is well worth sacrificing all authoritative power in order to obtain the inestimable advantage of a scientific, independent, and unbiassed body which would be continually investigating the state of Public Health and the value of measures designed to improve it, thereby reducing to a minimum the costly errors and futile efforts which have sometimes attended Public Health activity in the past.

[1] Mr. Bernard Shaw has said: "I do not know a single thoughtful and well-informed person who does not feel that the tragedy of illness at present is that it delivers you helplessly into the hands of a profession which you deeply mistrust." —Preface to *The Doctor's Dilemma*. And Miss Margaret McMillan, voicing uneducated opinion, has said: "Yet I think it is impossible to deny that while the individual doctor has many friends, the profession is regarded by the public with some doubt and even distrust. No one who has been engaged for years in trying to bring the doctor into the schools of the land can help knowing that there is a strong and deep feeling of misgiving at the thought of extending the power and influence of the medical profession."

CHAPTER XI

PUBLIC HEALTH AND LOCAL ADMINISTRATION

The responsibility of local authorities—The decline of democratic control in Public Health—Local needs and local control—Local administration and the cost of sickness—A single local health authority or 'Local Health Council'—Should the Health Council be the present Local Authority or a new body?—Coördination of the Local Health Council and the Local Authority—A suggestion for financial arrangements—The question of a local medical service—The position of the voluntary hospitals—Conclusion.

The Responsibility of Local Authorities

Local administration in Public Health is, or should be, governed by very different principles from those observed in central administration. Local authorities—including in the term not only Local Sanitary Authorities, but Insurance Committees, Boards of Guardians, etc.—are the actual executive bodies, since they have to carry into effect all orders and decisions, whether made by themselves or by higher administrative authority, or embodied in Acts of Parliament. Democratic principles demand therefore that local authorities should have a large share in the making of these decisions, and in determining the means by which they are to be given effect. Though a central investigating body composed of scientific men must necessarily have severely limited powers, executive power must exist somewhere, and in the scheme to be outlined in this chapter it is proposed that local authorities —or rather one local authority formed by combining the various local Public Health authorities—shall be given the largest share in the control of Public Health affairs for local purposes.

The Decline of Democratic Control in Public Health

This is a democratic country, nevertheless the system of Public Health administration which has grown up is rapidly removing the control of the people over many matters which intimately affect their lives and welfare. We have seen that the Insurance Act was passed without any mandate from the country; this however was done by Parliament, and the constitution provides a means of reversing it—in theory at all events—if popular disapprobation is sufficiently great. But there is no means of controlling the actions of administrative bodies. Parliament more and more leaves matters unfinished or undefined in Acts of Parliament, and assigns to Government offices the duty of giving them shape and form; with the result that some of these offices are now almost legislative authorities, issuing orders and regulations of sweeping importance, which have not only not received democratic assent, but clearly never would have received that assent. It might be argued that these orders and regulations relate to matters requiring special knowledge which are therefore unsuitable for democratic control, and if Departmental administration had always been sound, and conducted solely with a view to public welfare, we might accept this proposition; but we have only to look again at the state of Public Health in this country, and to recall the numerous mistakes, muddles, and partiality of Government offices, in order to realise that local democratic control would at least not have been a greater failure than control by civil servants who are in no sense representative.

It may be noted that even when an Act of Parliament purports to give a degree of local autonomy, liberty of action may be nullified by the central Departments. Consider, for example, Section 15 of the Insurance Act which begins: "Every Insurance Committee shall for the purpose of administering medical benefit make arrangements with duly qualified medical practitioners in accordance with regulations made by the Insurance Commissioners." An ordinary person reading these words would suppose that

Insurance Committees had some freedom of action in regard to medical benefit, and his belief would be strengthened by other elaborate provisions of the Act for securing that Insurance Committees should be representative of insured persons, County Councils, etc. But as a matter of fact all arrangements made by Insurance Committees must be "approved" by the Insurance Commissioners, and by the simple process of intimating beforehand the only arrangements they will approve, the Insurance Commissioners obtain at one stroke entire control throughout the country. Insurance Committees have no voice in determining the rate of remuneration of doctors, or the scope of medical benefit, and no power to make better arrangements. A glance at the agenda of an Insurance Committee will show how trivial are the matters in which they are allowed any freedom, and as a matter of fact, almost all their duties could have been discharged by a clerk directly appointed by the Insurance Commissioners. The result is that men of public spirit and energy do not care to accept positions of so little dignity and importance, and local administration suffers. This has been well expressed by a recent writer in the *Hearts of Oak Journal* who, commenting on resignations of members of the City Council of Exeter from the Insurance Committee, said: "We need not examine grievances in detail. Every one who has been associated with the management of the Act is cognisant of the struggle that has been waged between local administration and bureaucracy. It is a case of centralisation *v.* decentralisation, and the central powers having the purse have been able to make their will prevail. Insurance Committees are now very little more than conduits, without initiative or authority, and I believe the public men who have just retired from the Exeter Committee feel that they can put their time to better use."

It is important to bear in mind the extent to which local bodies are controlled by higher authority, since this is one reason why local administration sometimes appears defective, and is blamed unjustly. Those who advocate centralisation of Public Health control generally do so on

the ground that local authorities are inclined to be 'apathetic,' and that the central Departments must be in a position to bring pressure to bear upon them. But we cannot rely upon this pressure being exercised even where it would be justified; and for many difficulties and apparent neglect, the central Department is often more to blame than the local authority. The Local Government Board or the Insurance Commissioners, however much they may inspect and obtain reports, can never be as fully informed of the local conditions and difficulties as those who are living on the spot, and if a central authority issues orders which are inappropriate, or refuses assent to schemes which are sound, the local authority is too often blamed for the consequent failure.

Local Needs and Local Control

Another reason for giving wide discretionary powers to local authorities in Public Health administration is the fact that they know better than any central authority what are the causes of sickness in the locality, and how they may best be prevented; and decentralisation permits of wide elasticity in the measures taken according to local needs and exigencies. The conditions and requirements of Public Health in different localities—an industrial town, an agricultural district, a seaport or a mining area, are so diverse that it is simply impossible to deal with them by uniform methods; yet this is what centralisation involves. We have applied a rigid and uniform panel system over the whole country, yet so enormously does the demand for medical attendance vary, that while one doctor finds his remuneration averages 1s. 6d. per attendance, another receives several pounds for each visit or consultation. We have made the Notification of Births Act compulsory over the whole country, yet we have seen that the distribution of infant mortality is exceedingly unequal, and that in a large number of rural districts it is probably as low as it is possible to make it by human endeavour. Identical conditions of bad housing or overcrowding are far more injurious, and demand more radical

treatment in large urban areas than in country villages; and the incidence of tuberculosis, venereal diseases, inebriety, etc., vary within such wide limits, and depend so much upon local conditions, that they can only be dealt with effectively by persons intimately acquainted with the circumstances of the locality. The application of uniform methods is extravagant and inefficient, and the belief that what is good for one district is necessarily good or desirable for another, leads to an erroneous method of measuring a local authority's activity, which is a further cause of unreasonable complaint against local administration. Critics of a Borough Council's work do not estimate its value from the local death-rate or incidence of sickness, which often they know nothing about, but from the number of officials it has appointed, and the number of schemes it has devised for doing things, many of which may be unnecessary. If a Borough Council has not appointed a staff of health visitors, it is certain nowadays to be held up to public obloquy, no matter how low the local rate of infant mortality may be. Under the scheme here proposed, the local authority responsible for the case of Public Health should have full control over all matters pertaining thereto, except those which must obviously be uniform over the whole country, such as the methods of preventing food adulteration or the notification of industrial diseases; should have power to provide whatever medical services, institutions, etc., are necessary in the locality; and should be able to act on its own initiative without having to incur the delays necessitated by continually submitting its proposals to Government Departments.

Local Administration and Cost of Sickness

If local authorities are made responsible for the care of health and for the provision of medical services and institutions for treatment, it almost necessarily follows that each locality must bear the cost, or the major part of the cost, of these measures. This principle has the great advantage that by making each locality pay the cost of its own sickness, a strong stimulus is provided towards

remedying insanitary conditions. Ratepayers and local authorities would find that in the long run it was much cheaper to clear slums and otherwise establish healthy conditions, than to pay for the continued upkeep of hospitals, infirmaries, sanatoria, and medical services. Moreover, this system is very much fairer in view of the unequal incidence of sickness. We have seen how the Insurance Act is operating as a tax on rural areas for the benefit of industrial towns; and a large part of Government expenditure and Parliamentary grants-in-aid, provided out of general taxation for Public Health purposes, such as those for the school medical service, Poor Law infirmaries, housing schemes, and infant clinics, in the last analysis, penalise healthy for the benefit of unhealthy districts and industries. Perhaps the most striking example is the recent provision for the treatment of venereal diseases. Although the report of the Royal Commission showed that syphilis is much more prevalent in large towns than in rural districts, only 25 per cent of the cost is to be raised locally, and 75 per cent is to be provided by Government grant, thus making many districts where syphilis is almost unknown contribute a substantial part of the expenditure, and proportionately reducing the incentive to the Local Authorities, where the incidence of the disease is high, to take steps to prevent it. Nor are grants-in-aid alone involved, for healthy localities are also paying an unfair share of the cost of central administration and official salaries.

While the general principle of local payment of cost might be observed, it would not necessarily be sound to insist on its rigid observance in every case. Very poor districts might legitimately receive special assistance, and where the action of one authority benefits contiguous areas, as in a scheme for water-supply or drainage, the cost would need to be apportioned. Moreover, the sickness in a particular district may not be entirely its own fault; the sickness in Stepney, for instance, is undoubtedly partly due to the fact that it is surrounded by other unhealthy districts, but for the purposes indicated, London would probably have to be regarded as one unit. These how-

ever are matters of adjustment which do not affect the general principle.

To summarise then, the chief reasons for increasing local authority in Public Health are: (1) to preserve democratic control; (2) to enable local authorities to provide exactly what they need; and (3) to give them a direct incentive in reducing local sickness to the minimum. The charge that local authorities are apathetic is not established as a general truth. We have already noticed the zeal displayed by Bradford and other Borough Councils, and an increase in the dignity and power of these authorities would attract men of capacity to their service, and stimulate public interest in the problems with which they deal.

A Single Local Health Authority or 'Local Health Council'

We have seen that in central administration of Public Health it is desirable to keep certain Departments separate, since their medical duties are so closely related to their general spheres of activity; but in local administration the reasons for division of authority no longer hold good. A local authority is concerned with a definite geographical unit, and a community of persons all subject to more or less the same conditions, and it is wasteful and inefficient to have a number of uncoördinated bodies, Local Sanitary Authorities, Insurance Committees, Boards of Guardians, and Education Authorities, each concerned with a special section of the community as though it were in a water-tight compartment. These should be replaced by a single body or 'Local Health Council,' as it might be termed. The new authority should be concerned with the health of all persons within its district; it should be empowered to investigate all the causes responsible for preventable disease within its jurisdiction, and it should provide the medical attendance, hospitals, sanatoria, lying-in homes, convalescent homes, and other institutions which the particular conditions within its area necessitate. If this plan were adopted, certain local administrative bodies would disappear, and

others would remain simply to discharge non-medical functions. It has already been suggested that medical and sanatorium benefit should be taken out of the Insurance Act; and Insurance Committees could then be abolished, the obligation to provide necessary medical attendance not only for insured persons, but for their dependents being discharged by the Local Health Council, while all sanatoria and dispensaries for tuberculosis would pass into their possession. The Boards of Guardians would hand over to the new authority their duty of providing for the sick poor, no longer to be distinguished from other classes of the community unable to afford adequate medical attendance, and their work in connection with public vaccination; and would transfer their infirmaries and similar institutions, and their staffs of indoor and outdoor medical officers. Thus the Guardians would remain simply as an authority for the relief of destitution. The school medical service would be administered by the Local Health Council, but only as a part of a larger scheme for providing for all children whether at school or not. The Medical Officer of Health would be the chief permanent medical officer of the Local Health Council, and the tuberculosis officers and staff of sanitary inspectors, health visitors, etc., would pass under its control; the local registrar of births, deaths, and marriages should be affiliated to the Council; and the Coroner should be required to send to the Council reports on all deaths from industrial diseases, neglect, starvation, lack of medical attendance, etc.

Should the Local Health Council be the Present Local Authority or a New Body?

The question remains to be considered whether the Local Health Council should be the present Local Authority with its powers enlarged, or whether it should be an entirely new body to which are transferred the Public Health duties of the present Local Authority together with those of other authorities. The first system has the merit of simplicity, since it would place all local administration

in the hands of one body. Nevertheless it appears to the writer more advantageous to adopt the second, thus giving us a Local Health Council in every County and County Borough dealing exclusively with Public Health affairs, and a Local Authority concerning itself with all other spheres of municipal activity. A plan for coördinating these two bodies, and for adjusting certain matters wherein they might overlap, will be considered later.

The first reason for advocating an independent Health Council is the fact that the present Local Authority may be influenced by different and opposite motives, some of which may not operate in the interests of Public Health. It is the rating authority, and usually a proportion of its members have been elected for the express purpose of lowering the rates; while at the same time it is expected to undertake schemes for the protection and improvement of the Public Health, some of which may be of a costly character. Secondly, a Local Authority is usually, and quite properly, interested in the commercial prosperity of its town or district; and since local administration has tended to pass largely into the hands of the trading and business class, the Local Authority may be unduly concerned in protecting commercial interests to the prejudice of Public Health. A scheme for rebuilding or widening a main street or establishing an open space is considered not only from the point of view of Public Health, but also as regards the effect it will have on the general trade of the locality and on the interests of the shopkeepers displaced, some of whom may actually be members of the Local Authority. In a fashionable resort or seaside watering-place a fever hospital must not be built here or a sanatorium there, lest it may keep visitors from the town; in an industrial district, the interests of the factory, in which large numbers of the local people earn their living, and which has perhaps 'made' the town, must not be unduly interfered with. Nor is concern lacking for even humble interests. In many districts costers are permitted to crowd narrow thoroughfares with their stalls, and litter the road with vegetable refuse, simply because they have an ancient prescriptive right to be there. It is not

suggested that Local Authorities are wrong in taking this attitude, having regard to their character and general functions, but it is one which clearly must often conflict with strict concern for the Public Health.

As regards the method of appointing a Local Health Council, while the principle of democratic control must be observed, it would perhaps be better for the Council to be nominated by bodies themselves elected rather than be directly elected by popular vote. It may be suggested that the Local Authority should nominate one-half of the members of the Local Health Council, which would in effect amount to its transferring its Sanitary Committee to the new Authority. One-quarter might be nominated by the Boards of Guardians, and the remainder by the managers of local hospitals and the Ministry of Health. One member might be nominated by the Member of Parliament for the locality, a system which would give the Health Council a direct connecting link with Parliament, and afford ready expression of its opinions in the legislature. The advantage of nomination over election lies in the fact that it would enable persons to become members of the Council who would not care to face popular election, such as professional men, writers, and University lecturers. A service which had a sphere of scientific investigation and a direct concern with all Public Health questions would undoubtedly prove attractive to a type which at present rather tends to hold aloof from municipal administration.

In London the question is more complicated. Perhaps the best plan would be to enlarge the powers of the Metropolitan Asylums Board, making it the general authority in London to provide medical services, and leave to the London County Council most of its present Public Health duties. The London Insurance Committee would disappear. A Local Health Council could be created in each of the Metropolitan Boroughs, but the division of function between it and the enlarged Metropolitan Asylums Board would require to be defined. The Boards of Guardians would remain only as authorities for the relief of destitution.

Coördination of the Local Health Council and the Local Authority

In most directions, particularly those of providing local medical services, the duties of the Local Health Council would be sharply defined, but inconvenient overlapping might arise in certain matters which are not exclusively concerned with Public Health, such as Town Planning and housing schemes, and water-supply. These matters involve heavy expenditure, interference with vested interests and rights, compensation and other legal questions with which, apart from their Public Health aspects, the Local Health Council would not be best suited to deal. Matters of this nature, which concern closely both Authorities, might be referred for settlement to a standing Joint Committee, one-half appointed by the Local Authority, and one-half by the Local Health Council.

A Suggestion for Financial Arrangements

It would obviously be highly inconvenient to have two authorities raising local funds, and the Local Authority must clearly remain as the only local rating authority. Moreover, it must have reasonable power to control or approve of expenditure by the Local Health Council, for if the latter were given *carte blanche* to spend what it liked, its zeal might easily outrun economic discretion. The following scheme for securing co-operation may be suggested: The Local Health Council should annually estimate its expenditure for the forthcoming year, and present this estimate to the Local Authority with a full statement as to the reasons for the expenditure, the Local Authority being entitled to ask for any further information it considered necessary. If the Local Authority approved the expenditure, it would provide the sum required. If it disagreed on any points, these matters should be referred in the first instance to the Standing Joint Committee. If the Committee were unable to arrive at a settlement acceptable to both authorities, then the disputed questions should be referred for final decision to the Local Govern-

ment Board acting in conjunction with the Ministry of Health.

The Question of a Local Medical Service

The provision of a complete and adequate medical service for the treatment and care of sick persons is one of the most difficult questions which the country must face in the near future. The service established under the Insurance Act has not fulfilled its original intentions, has been very costly, and has given rise to widespread dissatisfaction. It is well known that reorganisation of the panel service is contemplated, and the proposal to establish a national medical service, though not generally approved by the doctors, is steadily gaining adherents. In favour of a national service it is argued, that while paying the doctors good salaries it would be less costly than the present system ; that it would enable a better distribution of doctors to be made ; that the doctors would no longer be competing against each other for patients or be influenced by financial considerations ; and that consultants, specialists, and institutional treatment could be added to the service. The extreme proposals extend to nationalisation of the voluntary hospitals. Against a national medical service it is urged, mainly by the doctors, that it would preclude freedom of choice of doctor by patient, would make the doctor a servant of the State thereby limiting his freedom of action, and would lessen his personal interest in the welfare of his patient.

It is doubtful however whether those who advocate a national medical service have fully realised the immense difficulties which stand in their way. Let us for the moment fix attention upon that part of the service which is concerned with medical practitioners, leaving institutional and special treatment for later consideration. In the first place the service must be open to all but the upper and middle classes ; for as soon as we begin to define the persons who should be entitled to the service, we find it impossible to draw any other line than that which would be voluntarily adopted ; and this would entail a much greater degree of interference with private practice than

was effected by the Insurance Act. A service of whole-time salaried officers clearly could not be restricted to insured persons, for that would lead to one doctor attending the father, and another the wife and children, a system which would never be satisfactory. If the doctors were only part-time, and were allowed to undertake private practice as well, other obvious objections would arise in many districts. The first enlargement then would be to include dependents of insured persons; but this would involve all kinds of difficulties in defining a 'dependent,' and it would leave out of the service a large number of poor persons who are neither insured nor dependents of insured persons. The next proposal accordingly is to take in all persons whose income is below a certain limit. But apart from the fact that it would be very difficult to obtain agreement as to what the limit should be, and that the scheme takes no notice of varying claims on income, it is almost impossible to determine incomes among the working classes; and in the end we should have to adopt the limit taken for revenue purposes, which the doctors would almost certainly consider too high. During the controversy over the Insurance Act the British Medical Association urged the fixing of an income limit of £2 per week. To observe this it would be necessary to obtain returns from millions of the working classes; to determine the annual incomes of wage-earners employed during part of the year and unemployed for another part, sometimes at one rate and sometimes at another, and perhaps in different localities; to decide questions of allowances for tools, insurance, children, etc.; and to determine the position of the wife's income from charing, or the son's from selling newspapers. The scheme is so impossible that it is difficult to realise how it could ever have been seriously put forward. It would be practicable to adopt the income tax limit, but even this would entail an immense amount of indexing, registering, compiling of doctors' lists, etc. The number of income tax payers and their dependents in England and Wales has been estimated at some six millions.[1] Under the scheme, therefore, the State

[1] This was before the recent lowering of the limit of income subject to taxation.

would have to provide a medical service for some 30,000,000 persons, and find salaries for the great majority of general practitioners in the country. However strongly this course may be urged, we may be certain that under circumstances now existing, and likely to exist for a considerable time, it will not be adopted. Moreover, for large numbers of people in healthy districts a medical service is by no means the most pressing need, and even in towns a service of general practitioners is not nearly so urgently required as an increase of hospital accommodation. Finally, we must recognise that rightly or wrongly the great bulk of general practitioners are strongly opposed to a national medical service, and no one wishes the scenes and incidents of 1911 and 1912 to be repeated ; yet without the co-operation of the practitioners, a national service is almost impossible of achievement.

But even if it were feasible, the great objection to a national medical service remains, viz. that it takes little cognisance of differences in local needs and conditions. It applies the same principle to Bournemouth and Birmingham, to Cumberland and Camberwell. Under these circumstances therefore it is suggested that we should abandon the idea of a rigid, centralised medical service, and endeavour to establish instead an elastic, local medical service under the Local Health Council, which should have wide powers to vary the service according to the needs of its district.

The reasons for leaving the form of a medical service to local decision are even more numerous than those which apply to other branches of Public Health, for in addition to variations in the causes and incidence of sickness, it is necessary to take into consideration social circumstances and geographical conditions. Difficulties which arise in Kensington would not occur in Whitechapel. In one district the establishment of a complete medical service working through clinics would meet with no opposition ; [1]

[1] It is of interest to note that such a system has been in operation for many years at Swindon among the 43,000 employees of the Great Western Railway and their families. There is a staff of doctors with graduated salaries, and the town is divided into a series of districts, each under the care of one doctor with a central dispensary for the whole system. The medical service is good and the arrange-

in another it would only be necessary to supplement private practice by appointing a certain number of salaried medical officers in charge of public dispensaries ; in scattered areas arrangements could be made with private practitioners to attend outlying villages or hamlets ; and in yet others the doctor might be guaranteed a minimum income, or provided with a motor or a house on the lines followed by the Highlands and Islands Board, a development which itself shows how local circumstances have compelled a modification of a general scheme. Different systems of payment would be available, and would enable the remuneration of a doctor to be adjusted broadly to the time and services he gives. A capitation fee which yielded 1s. 6d. per attendance would be recognised as too low, and one from which the return is measured in pounds per attendance as too high. The arrangements made with the doctors might only apply to certain areas, and the doctors could be limited as to the number of patients they attended. It may be noted that since the fundamental cause of dissatisfaction among the doctors is interference with lucrative private practice, the poorer the district and the greater its needs the less likely is difficulty to arise.

The Local Health Council should also be empowered to investigate the need for special or hospital treatment in its district, and to provide whatever forms of institutional treatment are required. Probably in most districts this would be found to be the most pressing want, and if adequately met, it would often not be necessary to provide general practitioners or interfere with private practice at all. The Local Health Council would take cognisance of voluntary hospitals in the district; and its endeavour would be not to establish its own complete service, but to supplement existing services and make good deficiencies, providing in one district a hospital, in another a sanatorium, in another a convalescent home, while infant clinics, children's clinics, lying-in homes, bacteriological laboratories, and institutions for the permanently disabled

ments appear to have been satisfactory to both patients and doctors. Such a scheme is only feasible where the area is compact, the persons entitled to the benefit of the service are clearly and easily defined, and the bulk of the population consists of these persons.

who require medical care should all be within its province to establish if necessary.

Towards the provision of these services the Local Health Council would have already entered into possession of municipal hospitals and sanatoria, Poor Law infirmaries, school clinics, and kindred institutions. Where further accommodation was needed, the Health Council should be able to build its own hospitals, or make arrangements with voluntary hospitals, or combine with adjacent localities in the joint use of hospitals. Coördination alone would appreciably increase accommodation, for at times Poor Law infirmaries have many vacant beds while voluntary hospitals in the same town have long waiting lists. There are signs of a new era in hospital construction which should substantially reduce the cost of building. Open-air treatment is now being extended to infectious diseases; and at Cambridge an open-air hospital with 1450 beds has been erected for wounded soldiers and has achieved highly satisfactory results. Dr. Shipley considers the cost of construction of the Cambridge hospital to be only £17 per bed.[1]

The Position of the Voluntary Hospitals

These proposals open up an exceedingly wide and important question, viz. the relation of the voluntary hospitals to the scheme proposed, or to any other scheme for reorganisation of the public medical services. Nationalisation or State support of the voluntary hospitals has been strongly urged by that school which believes in the advantage of nationalisation or municipalisation as a general principle. But the reasons adduced for applying the principle to the voluntary hospitals are not convincing. It is stated for one thing that the hospitals are often inadequately supplied with funds, and that they cannot therefore increase their accommodation to meet the demands made. This is undoubtedly true, but it furnishes only an argument for supplementing the voluntary pro-

[1] Further details of this interesting experiment will be found in Dr. Shipley's pamphlet, "The Open-Air Treatment of the Wounded."

vision, and not for State acquisition of the whole system. Another reason, which possesses more force, is that the care for national sickness should be a national charge, and should not be left to the uncertain charity of philanthropic persons. To those general arguments are sometimes added assertions that the hospitals are extravagant and in some cases inadequately staffed.

But while due consideration must be given to these views, the arguments against them appear to the writer overwhelming. In the first place most of the larger hospitals, though not technically so, are actually "national" for all practical purposes, particularly those which have accepted a degree of supervision by the great hospital funds, to which contributions are made by all classes of the community. Most hospitals publish accounts of their expenditure; are governed by a representative body of managers; and are liable to public criticism for errors or inefficiency, which is far more likely to be effective than if they were institutions of the State. Moreover, there is little scope for improved management under State control, for the organisation and internal administration of the British hospitals has deservedly earned a high reputation. When we consider the number, size, and variety of the voluntary hospitals, the extent of the funds they handle, the number of persons who receive treatment from them, the responsibility of their work, and the tact and discretion demanded in maintaining harmonious relations between patients, doctors, nurses, and subscribers, it is astonishing how rare are complaints of inefficient treatment, mismanagement, or malversation of funds. In a nation not conspicuous for excellence of public administration very strong reasons should be shown before terminating this system and placing the hospitals in the hands of the Civil Service. The medical staffs of the voluntary hospitals are almost always selected on the grounds of merit, and in the making of appointments there is far less nepotism or exercise of improper influences than occurs in the Civil Service Departments.

Another reason is of a practical rather than an ethical character. The community should realise that in the

hospital service at all events they have made an exceedingly good bargain with the doctors. It is probably not often appreciated that as far as private practice is concerned the whole body of consulting physicians, and still more of surgeons draw their *clientèle* from a small fraction of the community. Harley Street and Wimpole Street derive more income from an acre in the west than from a square mile in the east of London; and it is only the voluntary hospitals which bring their services to the aid of many thousands of poor persons. It is not denied that there are indirect advantages in being on a hospital staff, particularly to the younger men who have yet to make their reputations, but we find many eminent physicians and surgeons to whom such considerations have long ceased to appeal, continuing to visit the hospital year after year on their appointed days, and discharging their duties without remuneration. In their case, while admitting that the work is of interest and the position dignified, undoubtedly a sense of duty to the hospital and philanthropy to the poorer sections of the community keeps them at their post. If the voluntary hospitals were converted into State institutions under official control, it is very probable that this public-spiritedness would be lessened, and the doctors would be justified in asking for remuneration for their labours.

Yet one more point must be mentioned. If the State were to take over the hospitals, many charitably-disposed persons would consider that the hospitals no longer required private support, and would seek other opportunities for their benefactions. Thus the State would find itself committed to heavy expenditure upon the staffing, civil and medical, of the hospitals, and would find simultaneously the ordinary income of the hospital rapidly decline. Under present circumstances therefore it may be assumed that nationalisation or municipalisation of the voluntary hospitals is a remote contingency.

Nevertheless the voluntary hospitals must form an important part of a local medical service; and this could be effected by empowering the Local Health Council to make any agreements with the hospitals which seemed

suitable and were acceptable to both parties. In some districts the Health Council might itself supplement the voluntary provision by building or enlarging its own hospitals; in other districts it might agree with the voluntary hospitals for the latter to undertake the treatment of a certain number of persons, or of certain types of diseases or special affections; and in yet others it might assist the hospitals to enlarge their buildings. But the last two suggestions involve payment to the funds of the hospitals, and this is the crux of the difficulty, for the moment public money is paid, the cry is raised that public control should be exercised. Now this is undoubtedly a sound general principle, but it may be carried too far if it exacts control on purely theoretical grounds where no reasonable need for that control exists. Whatever may be the technical position, the public already possesses a substantially greater degree of control over the hospitals than it does over Government Departments, for the former are amenable to public opinion while the latter are almost regardless of this. Moreover, the principle is even now not rigidly observed. In various parts of the country Local Education Authorities have made arrangements with voluntary hospitals to treat school children for ringworm, defective eyesight, enlarged tonsils, etc., and for these services substantial contributions have been paid to the hospital funds, but the Education Authorities have not stipulated for any voice in the internal administration of the hospitals. Another instance is afforded by the recent provision for the treatment of venereal diseases by the voluntary hospitals, where, though public money is to be spent, neither the Local Government Board nor Local Authorities have claimed any right to interfere with the management of the hospitals.

These arrangements afford instances of the way in which voluntary hospitals could be fitted into a scheme for a local medical service. In some instances, however, Local Health Councils may wish to make substantial grants for enlarging or rebuilding hospitals, and in these cases it is suggested that the Health Council should have the right to satisfy itself that the grant is actually

expended upon the purpose for which it is made. If a new wing is to be built, the Health Council shall have the right to see that the money is spent exclusively upon that new wing, and no part of it upon repairs or reconstruction of older buildings; and if the Health Council agrees to pay for the annual maintenance of a hundred beds in the hospital, it shall be entitled to see the accounts and ascertain that the money is spent solely upon those beds; but this right should give it no voice in the making of appointments, or in medical or administrative questions except such as may be agreed upon. These powers would form a sufficient safeguard of public interests, and at the same time would probably be regarded as reasonable by the hospital managers. If the proposal that the voluntary hospitals should nominate certain members of the Local Health Council be adopted, agreements between the two bodies would be facilitated.

Conclusion

The main object of this book has been to demonstrate the need for complete reorganisation of the Public Health services. There is in this country an immense amount of entirely avoidable sickness, and we fail very gravely to make the best use of modern medical and scientific knowledge to prevent it. We spend vast sums on mere palliatives, and we fail to handle vigorously the great environmental causes of disease which entail further cost by helping to fill our gaols, asylums, and workhouses. As a first and immediate step it is urged that we should create a Ministry of Health which should itself examine the whole position, and report upon what further changes are desirable in the way of coördinating central administration, giving local authorities effective power to deal with the causes of disease, and making provision for the care and treatment of those who cannot obtain these advantages under the present confused and imperfect system. We must necessarily proceed by steps, but each step should bring nearer the achievement of a complete

and coördinated scheme for the protection of the public welfare.

Humanity cannot escape suffering, for that is inseparable from life; but organised society can abolish much of the misery which results from disease. No nation has yet realised the immense possibilities which exist in this direction, and in the past the efforts to improve Public Health have been haphazard and costly. But the era which will follow the war will see new methods adopted, new ideals pursued, and added value attached to human life. Already great changes have been effected in social customs, which long years of peace might have failed to achieve. Russia has swept away much of her drink traffic; we have prolonged our hours of daylight to the advantage of all classes, and have made individual interests and rights of property subservient to the national welfare in a degree unprecedented. Stern lessons too have brought home to every one the ultimate dependence of all upon the produce of the land. The grave problems which the early years of peace must bring more and more demand and receive attention. We hear of vast schemes for the reorganisation of Imperial Government, conferences on trade, proposals for international co-operation, plans for increasing the return from the land, reform in education, and greater application of science to industry. But no insistent voice has yet made itself heard on behalf of the nation's health. Yet this may be the most useful task of all, for though material needs must be met, prosperity brings little happiness to those worn by disease or physically imperfect. Some of the steps proposed on economic grounds will themselves do much to promote national health. The benefits of settlement on the land, of afforestation, and of agricultural development will not be represented fully by increase of acres under cultivation or enlarged returns of wheat; but we have no means of expressing in figures the further gain in human growth and vigour which these movements will bring. The secret of health is to live the life for which we are constituted; but for centuries man has ignored this truth, and the loss of his health is the penalty demanded from him for having

in his great cities permitted social development to outstrip natural evolution. To-day his knowledge is sufficient to enable him to work with Nature instead of against her; to undo many of the evils he has unwittingly created; and to save the lives of his offspring now sacrificed to the blind driving forces of industry. To apply this knowledge widespread, is one of the first tasks of Peace.

INDEX

Abortifacients, sale of, 280
Abortion, criminal induction of, 287
Acland, Mrs. Francis, quoted, 164, 303
Adulteration of food, 7, 265
Afforestation, value of, in Public Health, 152
Agriculture, Board of, Public Health duties of, 290
Alcoholism and disease, 141, 281
  in Liverpool, deaths from, 307
Allbutt, Sir Clifford, on medical benefit, 230
  on Public Health administration, 309
  on small value of drugs, 190
Atmosphere, effects of smoke and dust in, 87
Atmospheric Pollution, Committee for Investigation of, 90
Atrophy, debility, and marasmus, deaths from, 97 *et seq.*

Baths, insufficiency of, in Bermondsey, 79
  therapeutic value of, recognised in Greece, 3
Bathurst, Captain, M.P., on Insurance Act, 133
Beevor, Sir Hugh, M.D., on infectivity of tuberculosis, 51
Birth, premature, deaths from, 98
Birth-rate, decline of, 18
Board, Local Government, Public Health duties of, 288
  of Agriculture, Public Health duties of, 290
  of Guardians, establishment of, 294
    Public Health duties of, 292
  of Trade, Public Health duties of, 289
Bradford, earnings of panel doctors in, 179
  infant mortality in, 107
  medical service in, intended, 227
Breast-feeding, 74
Bronchitis, death-rates from, 140
Browning, Mrs. E. B., quoted, 22
Brownlee, Dr., on typhus, 37
Building, cost of, 163
Burns, Rt. Hon. John, on Public Health, 56
Butter, adulteration of, 269, 273

Cancer, mortality from, 141
Capacity to work and sickness benefit, 245
Central Midwives Board, 291
Chester-le-Street Rural District, conditions in, 91
Child-bed, mortality in, 195 *et seq.*
Children Act, 1908, and medical treatment, 226
  below school age, mortality in, 114
  in special schools, 129
Committee, Medical Research, under Insurance Act, 257
  on Atmospheric Pollution, 90
  on Lead in Painting of Buildings, 316
  on Lighting in Factories, 315
  on Physical Deterioration, 308, 317
  on Registration of Death, 316
Congenital malformations, deaths from, 97 *et seq.*
Coroner in relation to Public Health, 292, 296
Cream, adulteration of, 268
Croom, Sir Halliday, M.D., on unskilled midwifery, 201

Death-rate, decline of, in England and Wales, 35
  influence of surgery upon, 207
Developmental conditions, infant mortality from, 97
Diagnosis in panel practice, 180, 184
  of infectious diseases, errors in, 184
Diarrhœa and enteritis, influence of dust in causing, 95
Dick, Dr. Lawson, on rickets in London children, 118
Diphtheria, decline in mortality from, 42

Diphtheria, prevalence of, 47, 48
Diseases, principal, deaths from, in England and Wales, 136
Disinfection of rooms, 54
Dispensing, cost of, 231
Domiciliary treatment, 236
Drugs, exaggerated belief in value of, 169, 189
  supply of, under Insurance Act, 231
Drummond, Dr. Maxwell, quoted, 203
Dust and epidemic diarrhœa, 95
  effect of inhaling, on lungs, 92
  collection of, and vested interests, 26
  siding at East Dulwich, 304

Education, Board of, Public Health duties of, 289
Employment of children out of school hours, 126
Enteric fever, decline of, 40
Esmonde, Dr., on sanatorium treatment, 243

Fabian Society, report of, on hospital accommodation, 176
Factories, segregation of, 157
Fever hospitals, utilisation of, 48
Fildes, Dr., on syphilis in London infants, 81
Fletcher, Dr., on conditions in Chester-le-Street Rural District, 91
'Floating sixpence,' the, 232
Food, adulteration of, 7, 265
  conditions under which prepared, 275
  unsound, sale of, 271
Foods, patent and proprietary, 276
Forbes, Dr., on infant mortality in Brighton, 84
France, medical men in legislature, 313
  state of Public Health in, 215
Fumigation of rooms, small value of, 54

Galsworthy, Mr., quoted, 20
Geddes, Dr. George, and puerperal fever, 201
General Board of Health, 1848, 298
  Medical Council, duties of, 290
  Register Office, duties of, 288
George, Rt. Hon. D. Lloyd, on insanitary conditions, 257
  on sanatorium treatment, 241
German origin of National Insurance Act, 212
Germany, medical benefit in, 217
  sanatorium statistics in, 243
  state of Public Health in, 214
Gibson, Dr. Thomas, on smallpox and typhus, 39
Glasgow Insurance Committee and validity of Regulations, 219
Glasier, Mrs. Bruce, on rural housing, 73
Greenwood, Dr., quoted, 76
Guardians, Board of, Public Health duties of, 292

'Half-timers,' illegal employment of, 128
Hammurabi's Code of Laws, 2
Hewlett, Prof., on tuberculosis, 43
Hillier, Dr., on sanatorium treatment, 242
Home Office, Public Health duties of, 289
Hospital accommodation, 176
Hospitals, deaths in, 173
  fever, admissions to, 48
  position of, in public medical service, 344
Houses, early efforts to prevent overcrowding of, 5
Housing, defective, 6, 158

India, disease in, 15
Infant mortality and industrial employment of women, 75
  and maternal ignorance, 77
  and occupation of father, 63
  and pre-natal conditions, 81
  and social conditions, 83
  causes of, 70 *et seq.*
  decline of, 105
  highest rates of, 66
  in Bradford, 107
  in Brighton, 84
  in France, 67
  in Germany, 214
  in Ireland, 67
  in London Boroughs, 83, 84
  in Paris, 89
  in Scotland, 96
  in United Kingdom, 65
  in Villiers le Duc, 63
  lowest rates of, 64
  pathological causes of, 93
Infant welfare, authorities concerned with, 302
Inspectors and visitors, list of, 303
Institutional treatment, growth of, 172
Insurance Act *v.* National Insurance Act—
  Committee, reports by, 258
  duties of, 292
Ireland, infant mortality in, 67
  uncertified deaths in, 207
  vital statistics of, 308

Keith, Prof., on teeth in Neolithic skeletons, 149
Kerr-Love, Dr., on weights of infants at birth, 86

Laboratories for special diagnosis, 186
Leeds, soot-fall in, 88
Leprosy, precautions against, among Israelites, 2
precautions against, in Middle Ages, 4
Lesser, Mr. E., on Public Health in Germany, 215
Letchworth, town planning in, 157
'Lightning' diagnosis, 180
Local Government Board, creation of, 299
Public Health duties of, 288
Health Committees in Insurance Bill, 222
medical service proposed, 340
sanitary authority, duties of, 291
London, infant mortality in, 88
overcrowding in, 154
Long, Rt. Hon. Walter, on sanatorium treatment, 242
Low, Dr. Bruce, on typhus, 37
Lungs, effect of inhaling dust upon, 92
Lynch, Mr. Arthur, on sanatorium treatment, 242
Lyster, Dr., on relative unimportance of housing, 162

Macaulay, Lord, on employment of school children, 129
McMillan, Miss Margaret, on public distrust of doctors, 328
Malaria, Sir Ronald Ross on, 14
Malingering, apparent frequency of, under Insurance Act, 247
Malnutrition in school children, 121
Maternal ignorance as cause of infant mortality, 77 *et seq.*
mortality in child-bed, 195 *et seq.*
Maternity benefit, value of, 204
service considered, 205
Maxwell, Dr. Drummond, on unskilled midwifery, 203
Maxwell, Sir John Stirling, on afforestation, 152
Measles, death-rates from, 49, 140
Meat, unsound, sale of, 271, 274
Medical Act, 1858, 284
benefit, 224
in Germany, 217
records under Insurance Act, 259
service at Swindon, 342
local or national, 340
treatment, and Public Health, 206
meaning of, 168
'Medicated' wines, sale of, 281
Medicines, patent and proprietary, sale of, 278
Metchnikoff on tuberculosis, 44
Metropolitan Asylums Board and provision of sanatoria, 296
Metropolitan Asylums Board, beds in hospitals of, 49
duties of, 295
erroneous diagnosis in cases sent to hospitals of, 185
Midwives and maternal mortality, 200, 318
attendance by, and infant mortality, 76
Milk, adulteration of, 266
Mortality in early childhood, 114

National Insurance Act, administration of, 219
and advancement of knowledge, 256
and insanitary conditions, 249
German origin of, 212
maternity benefit, 204
medical benefit, 224
records, 259
Research Committee, 257
sickness benefit, 245
National medical service considered, 340
Newman, Sir George, on defective children, 129
on defects in school children, 119
on infant mortality, 71
on vigour at birth, 82
Newsholme, Dr., on infant mortality, 71
on syphilis as cause of still-births, 103
Notification of Births Act, 106

Overcrowding, early efforts to prevent, 5
evil effects of, 153, 161
'Overlying,' cause of death in, 298

Panama Canal, construction of, delayed by disease, 12
Panel practices, size of, 178
Paris, infant mortality in, 89
Pathological causes of infant mortality, 93
Pearson, Prof. Karl, on Scottish vital statistics, 309
on tuberculosis, 43
Phthisis, death-rates from, in England and Wales, 240
death-rates from, in Metropolitan Boroughs, 139
Physical Deterioration, Committee on, 308, 317
Plague, mediæval efforts to stay, 3
Pneumonia, death-rates from, 140
Poor Law medical service, evolution of, 293
Population, densities of, in London and vicinity, 154
Poverty and infant mortality, 72
Pregnancy, notification of, 303

Premature birth, deaths from, 97 *et seq.*
Pre-natal conditions and infant mortality, 81
Privy Council, Public Health duties of, 289
Public Health reports, uncoördination of, 306
Puerperal fever, 200

Records, medical, under Insurance Act, 259
Recruits, defects in, 134
Reeves, Mrs. Pember, on family budgets among poor, 79
Register of sickness recommended, 308
Registrar-General and Ministry of Health, 319
Research Committee under Insurance Act, 257
Rickets in young children, 118
Robinson, Mr. R. A., on adulteration of food, 271
Rolleston, Dr. J. D., baths in ancient Greece, 3
Roscoe, Rev. J., on syphilis in Uganda, 15
Ross, Sir Ronald, on malaria, 14
Royal College of Physicians, resolution on unqualified practice, 285
report on infectivity of tuberculosis, 52
Royal Commission on Sewage Disposal, 316
on Tuberculosis, 315
on Venereal Diseases, 103, 143, 286, 316
Royal Commissions and Public Health, 315
'Rural' and 'Urban' Districts, distinction between, 68
Rural depopulation, 151

Sale of Food and Drugs Act, 270
Sanatorium benefit, 235 *et seq.*
administration of, 300
Scarlet fever, mortality from, 40
prevalence of, 47
Scharlieb, Dr. Mary, on syphilis and infant mortality, 71
School children, defects in, 120 *et seq.*
employment of, 126
medical treatment of, 192
nurse, 195
Scottish vital statistics, Prof. Karl Pearson on, 309
Sewage Disposal, Royal Commission on, 316
Ship Captain's Medical Guide, 290
Sickness benefit, 245
rates in men and women, 28
urban and rural, 132
Simon, Sir John, on Departmental administration, 325
on General Board of Health, 299
Sleeping out, 166
Smallpox, decline of, 39
variations in death-rate from, 33
Smoke, pollution of atmosphere by, 88, 90
Spencer, Herbert, on General Board of Health, 298
Statistics uncoördination of, 305
Stevenson, Dr., on chances of survival in infants, 86
on infant mortality and father's occupation, 84
on probable decline of syphilis, 144
Still-births, 103
'Summer camps' proposed, 165
Surgery, influence of, on death-rate, 207
'Survival-value' of national health, 10
Swindon, medical service at, 342
Syphilis as cause of still-births, 103
decline of, 44, 144
in London infants, 81
in Uganda, 15
mortality from, 142

Teeth, condition of, in school children, 123
defective, as cause of rickets, 118
Trade, Board of, Public Health duties of, 289
Treasury, the, Public Health duties of, 289
Tuberculosis and infection, 50
decline of, 42 *et seq.*
mortality from, 137
Typhus, decline of, 35 *et seq.*

Uganda, syphilis in, 15
Uncleanliness in school children, 124
Unqualified practice, 283
Unsound food, sale of, 271

Vaccination, provision of, 295
Venereal disease, treatment of, by unqualified persons, 286
Diseases, Royal Commission on, 103, 143, 286, 316
Vincent, Dr. Ralph, on zymotic enteritis, 95
Voluntary hospitals, position of, in public medical service, 344

Wanklyn, Dr., on housing conditions in London, 78
on overcrowding in London, 154
Westminster Health Society, 118
Whooping-cough, death-rates from, 49, 140
Women and sickness rates, 28

Printed in Great Britain by R. & R. Clark, Limited, *Edinburgh.*

UNIVERSITY OF CALIFORNIA LIBRARY
Los Angeles
This book is DUE on the last date stamped below.

AUG 2 9 1968
AUG 20 REC'D
BIOMED LIB
BIOMED OCT 28 '85
DEC 06 1985
REC'D
BIOMED JUN 2 8 '87
BIOMED LIB.
JUL 12 1987
REC'D

Form L9–25m-9,'55(B4283s4)444

3 1158 01038 736

UC SOUTHERN REGIONAL LIBRARY FACILITY
AA 000 956 559 9

RA
485
B75h

WA
900
FA1
B75h
1917

UNIVERSITY of CALIFORNIA
AT
LOS ANGELES
LIBRARY